Anritsu

SERVICE MANUAL

MICROWAVE SYSTEM ANALYZER

ME453A/B/C
ME538A/B/C

ANRITSU ELECTRIC CO., LTD.

TOKYO, JAPAN

1983.05 × 110 NIII-3(Y)

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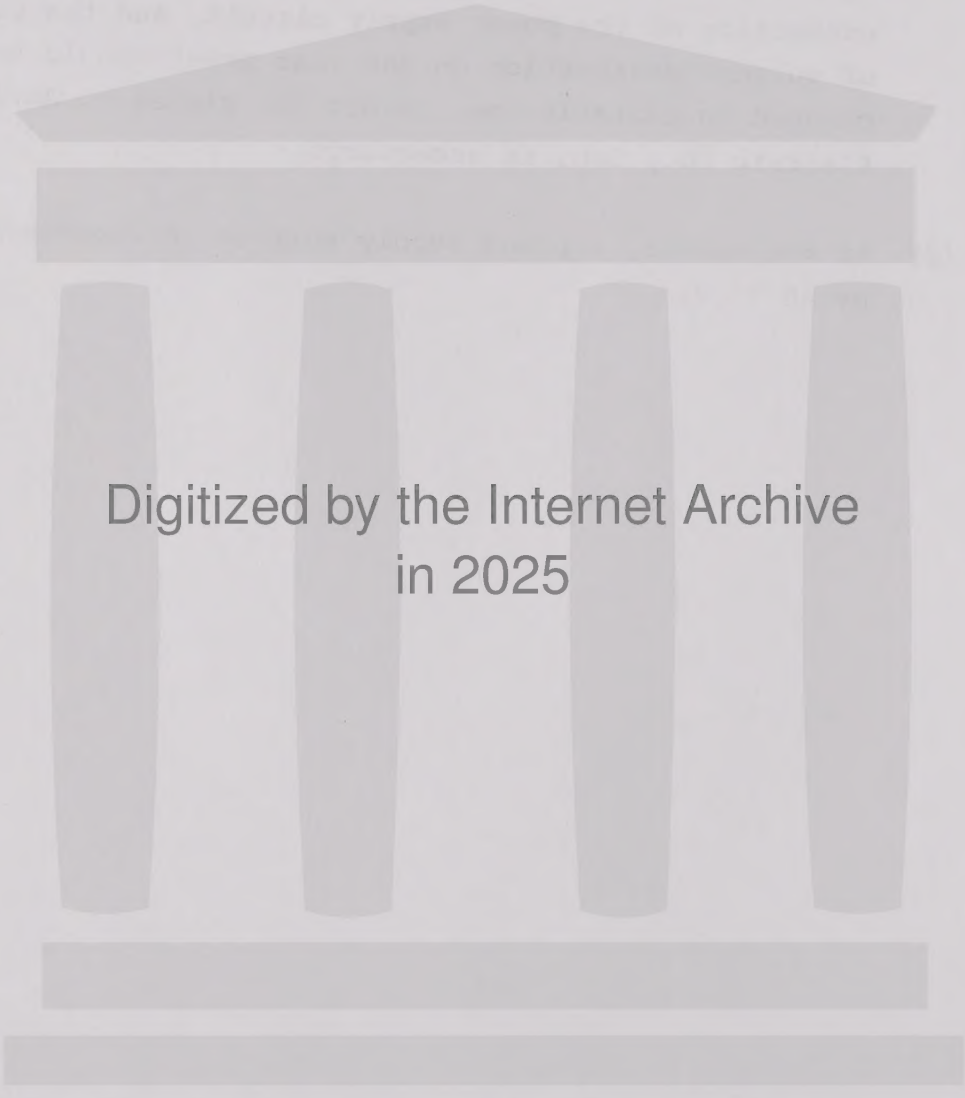
NOTES

(1) This equipment is operable on a voltage from AC 100 V to AC 127 V or from AC 200 V to AC 254 V by changing the connections of the power supply circuit.

The voltage is indicated on each rear panel when the equipment is shipped from the factory.

In the case of other voltage operation, change the connection of the power supply circuit, and the plates of voltage designation on the rear panel should be changed to suitable one. Order the plates to Anritsu Electric Co., Ltd. if necessary.

(2) In the manual, a power supply voltage is represented by AC ** V.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CONTENTS

		Page
SECTION 1	GENERAL INFORMATION	1-1
1.1	INTRODUCTION	1-1
1.2	MAINTENANCE PERIOD	1-1
1.3	ORDERING OF REPAIR PARTS	1-1
1.4	DISTINCTION BETWEEN PERFORMANCE CHECK AND CALIBRATION	1-1
1.5	SPECIFICATIONS	1-2
SECTION 2	PERFORMANCE CHECKS	2-1
2.1	INTRODUCTION	2-1
2.2	PERFORMANCE CHECKS	2-1
SECTION 3	PREPARATION OF REPAIR	3-1
3.1	INTRODUCTION	3-1
3.2	DECOMPOSITION	3-1
3.2.1	Decomposition of Transmitter and Receiver	3-1
3.2.2	Removing the Outer Cover	3-2
3.2.3	Removing CRT	3-3
3.2.4	Disassembly	3-5
3.3	INSTRUMENTS AND ACCESSORIES REQUIRED FOR CALIBRATION, ADJUSTMENT, TROUBLESHOOTING and REPAIR	3-13 3-13
3.3.1	Instruments	3-13
3.3.2	Accessories	3-13

		Page
SECTION 4	CALIBRATION AND ADJUSTMENT	4-1
4.1	INTRODUCTION	4-1
4.1.1	General Maintenance	4-2
4.2	TRANSMITTER	4-2
4.2.1	IF OUTPUT power	4-4
4.2.2	SWEEP WIDTH ±MHz	4-4
4.2.3	SWEEP OUTPUT VP/75Ω	4-4
4.2.4	BB OUTPUT level	4-5
4.2.5	FM DEVIATION	4-6
4.2.6	IF CENTER FREQ	4-6
4.2.7	BB FREQUENCY	4-6
4.2.8	SWEEP REDUCTION	4-7
4.2.9	SWEEP FREQUENCY	4-7
4.2.10	BB SWEEPER FREQUENCY	4-7
4.3	RECEIVER	4-8
4.3.1	IF LEVEL dBm	4-10
4.3.2	SLIDE MARKER	4-10
4.3.3	BB LEVEL dBm	4-10
4.3.4	DEVIATION kHz rms	4-10
4.3.5	Adjustment of Scale Sensitivity	4-12
4.3.6	Centering of SPECTRUM	4-13
4.3.7	SPECTRUM SWEEP WIDTH	4-14
4.3.8	P-P	4-14
4.3.9	X-Y RECORDER OUTPUT	4-15
4.3.10	INTENSITY	4-15

CONTENTS (Cont'd)

		Page
SECTION 5	TROUBLESHOOTING AND REPAIR	5-1
5.1	INTRODUCTION	5-1
5.2	TRANSMITTER	5-2
5.2.1	General	5-2
5.2.2	Troubleshooting of TRANSMITTER	5-6
5.2.3	Z1 IF OSCILLATOR AND AMPLIFIER	5-13
5.2.4	Z2 COUNTER	5-19
5.2.5	Z3 SWEEP OSC AND BB AMPLIFIER	5-27
5.2.6	Z4 BB OSCILLATOR	5-33
5.2.7	Z5 CRYSTAL OSCILLATOR AND BB SWEEPER	5-39
5.2.8	Z8 MOTHER BOARD	5-43
5.2.9	Z9 LED BOARD	5-47
5.2.10	Z10 FRONT BOARD	5-51
5.2.11	Z11 POWER SUPPLY	5-55
5.3	RECEIVER	5-59
5.3.1	General	5-59
5.3.2	Troubleshooting of RECEIVER	5-64
5.3.3	Z1 RANGING AND AVG	5-73
5.3.4	Z2 PHASE DETECTOR	5-81
5.3.5	Z3 BB DETECTOR	5-87
5.3.6	Z4 DISCRIMINATOR	5-93
5.3.7	Z5 IF MIX AND RETURN LOSS	5-99
5.3.8	Z6 MARKER AND SPECTRUM	5-105
5.3.9	Z7 CPU	5-111

CONTENTS (Cont'd)

		Page
5.3.10	Z9 MOTHER BOARD	5-121
5.3.11	Z10 OPERATING/LED BOARD	5-125
5.3.12	Z11 LED DRIVER	5-127
5.3.13	Z12 X SELECT/X-Y RECORDER	5-133
5.3.14	Z13 CRT DRIVER	5-139
5.3.15	Z14 POWER SUPPLY	5-143
5.3.16	Z15 AVG	5-147
5.3.17	Z8 GP-IB/Z18 CONNECTOR BOARD (OPTION)	5-151
SECTION 6	COMPONENT LISTS	6-1
6.1	INTRODUCTION	6-1
6.2	METHOD OF READING CAPACITORS/RESISTORS	6-3
6.2.1	Capacitor Identification	6-3
6.2.2	Resistor Identification	6-4
6.3	ORDERING INFORMATION	6-5
6.4	COMPONENT LIST	6-6

SECTION 1

GENERAL INFORMATION

1.1 INTRODUCTION

This manual contains the service information required to maintain the MICROWAVE SYSTEM ANALYZER ME453A/B/C and ME538A/B/C. It includes performance checks, troubleshooting techniques, adjustment, calibration procedures and repairs.

1.2 MAINTENANCE PERIOD

This test equipment is designed to permit stable performance over a long life. However performance may very due to stress and changes in the operating conditions. To use the Test Equipment in its initial condition, periodic maintenance and checks are required. If any problems occur, repair them in accordance to this service manual or contact the nearest ANRITSU service department.

1.3 ORDERING REPAIR PARTS

Parts required for repair should be ordered as explained in paragraph 6.4.

1.4 DISTINCTION BETWEEN PERFORMANCE CHECK AND CALIBRATION

How to check that the test equipment operates normally:

(1) Check that all functions are performed normally as explained in Section 2.

(2) Calibrate the levels and frequencies by referring to Section 4.

1.5 SPECIFICATION

Tables 1-1 and 1-2 list the specifications of this test equipment.

Table 1-1 SPECIFICATIONS

Measurements

Measurements \ Models		ME453A/B/C	ME538A/B/C	
		70MHz Band	70MHz Band	140MHz Band
Amplitude (IF INPUT terminal)	Inherent Slope	±0.05dB/±25MHz	±0.05dB/±25MHz	±0.05dB/±25MHz, ±0.1dB/±40MHz, ±0.2dB/±50MHz
	Measuring Range	0 to 16dB		
	Max. Sensitivity	0.01dB/DIV (Y2 display)		
	IF INPUT Level	+10 to −20dBm		
Amplitude (RET. LOSS INPUT terminal)	Inherent Slope	±1dB		
	Measuring Range	0 to 8dB		
	Sensitivity	1dB/DIV		
	INPUT Level	−60 to −20dBm		
Group Delay	Inherent Slope	0.3 ns/±15MHz, 0.5 ns/±25MHz	0.3 ns/±15MHz, 0.5 ns/±25MHz	0.3 ns/±20MHz, 0.5 ns/±30MHz, 1 ns/±50MHz
	Measuring Range	0 to 400 ns		
	Max. Sensitivity	0.1 ns/DIV (Y2 display)		
	Noise	0.01 ns/Condition: f_M − 200kHz to 278kHz, Deviation: 200kHz rms, using average function		
Linearity	Inherent Slope	0.2%/±25MHz	0.2%/±25MHz	0.2%/±50MHz
	Measuring Range	0 to 80%		
	Max. Sensitivity	0.05% DIV		
	Noise	0.005%/Condition: f_M < 1MHz, Deviation: 200kHz rms, using average function		
Differential Phase	Inherent Slope*1	0.3°/±15MHz, 0.5°/±25MHz	0.3°/±15MHz, 0.5°/±25MHz	0.3°/±20MHz, 0.5°/±30MHz, 0.8°/±50MHz
	Measuring Range	0 to 40°		
	Max. Sensitivity	0.2°/DIV		
	Noise	0.02°/Condition: f_M = 5.6MHz, Deviation: 500kHz rms, using average function *1 Specified frequency range = Carrier sweep width + 2 f_M		
Differential Gain	Inherent Slope*2	0.2%/±15MHz, 0.4%/±25MHz	0.2%/±15MHz, 0.4%/±25MHz	0.3%/±20MHz, 0.4%/±30MHz, 0.6%/±50MHz
	Measuring Range	0 to 80%		
	Max. Sensitivity	0.05%/DIV		
	Noise	0.01%/Condition: f_M = 5.6MHz, Deviation: 500kHz rms, using average function *2 Specified frequency range = Carrier sweep width + 2 f_M		
IF Return Loss	Frequency Range	70±25MHz	70±25MHz	140±50MHz
	Measuring Range	10dB to 50dB: Accuracy depends on the bridge used.		
	Sensitivity	1dB/DIV		
AM to PM Conversion	Residual PM	0.3°/dB/±25MHz	0.3°/dB/±25MHz	0.3°/dB/±35MHz
	Measuring Range	0.3°/dB to 16°/dB		
Spectrum	Center Frequency	70±20MHz Auto tuning	70±20MHz Auto tuning	140±30MHz Auto tuning
	Sweep width	Approx. ±700kHz		
	Max. Sensitivity	Detects 0.1dB change of modulating signal at carrier zero point.		
	Deviation	A type: 340kHz rms at 200kHz, B type: 472kHz rms at 277.778kHz, C type: 425kHz rms at 250kHz		
Deviation	Measuring Range	20kHz to 999kHz rms at the built-in BB frequencies ≤ 8.2MHz		
	Accuracy	10% at the built-in BB frequencies ≤ 8.2MHz		
	Calibration	Deviation is calibrated by easy pushbutton operation. Accuracy reaches 1% theoretically at the specified modulation frequency and deviation (as measured by the Bessel zero method) shown below.		
Modulator Sensitivity	Mod Signal Level	−50 to +10dBm		
	Deviation	Use the DEVIATION meter function or use the carrier zero deviation with the SPECTRUM function		
Demodulator Sensitivity	IF Signal	Calibrate the deviation with DEVIATION meter function or SPECTRUM function		
	Demo BB Level	−50 to +10dBm		
DC Input		Measuring range: 0 to ±400mV, Max. sensitivity: 1mV/DIV		
BB to BB Measurements (For all models)	Items	Inherent slope	Measuring range	Max. sensitivity / Noise
	Group Delay	0.1 ns	0 to 400 ns	0.1 ns/DIV (at Y2) / 0.2 ns
	Linearity	0.1%	0 to 80%	0.05%/DIV / 0.05%
	Differential Phase	0.1°	0 to 40°	0.2°/DIV / 0.05°
	Differential Gain	0.1%	0 to 80%	0.05%/DIV / 0.05%
	Measuring Condition	BB level: −30dBm		
BB Return Loss	Frequency	Built-in BB frequency or BB amplitude option		
	Range	10 to 40dB, 1dB/DIV (BB amplitude option)		

Model	MOD frequency	Key in factor
A type	200kHz	340kHz rms
B type	277.778kHz	472kHz rms
C type	250kHz	425kHz rms

Table 1-2 SPECIFICATIONS

Input/Output

	Items		Level range	Level accuracy	Impedance	
Input/Output (For all models)	IF Input		+ 10 to − 20dBm	± 0.3dB (+ 4dBm)	75Ω > 30dB (+ 4dBm	Demodulation frequency 66.6kHz, 80kHz to 8.2MHz
	IF Output		+ 10 to − 70dBm	± 0.3dB + 4dBm	75Ω [illegible]	Mod frequency 66.6kHz to 12.39MHz
	BB Input		+ 10 to − 50dBm	± 0.3dB (0dBm)	75Ω [illegible]	Frequency [illegible] to 5MHz
	BB + Sweep Output	BB	+ 10 to − 50dBm	± 0.3dB (0dBm)	75Ω > 28dB (− 10dBm)	Frequency 66kHz to 15MHz
		Sweep	0 to 6.5Vp-p/75Ω	± 10% (6Vp-p)	75Ω	Frequency 18Hz to 100Hz
	Sweep Output		0 to 25Vp-p/10kΩ	± 10% (24Vp-p)	—	Frequency 18Hz to 100Hz
	AUX IF Output		− 10dBm	± 1dB	75Ω	
	X'tal Output		+ 5dBm	± 1dB	75Ω	Frequency 70 or 70.140MHz
BB Amplitude (Option)			Frequency range 60kHz to 15MHz Level + [illegible]dBm [illegible]erence range ± 0.5dB [illegible]kHz to 3MHz Measuring range 0 to 8dB, Max sensitivity 0.1dB/DIV			
Power			Max. 200VA Voltages are available at the rear panel. [illegible] VA [illegible] the request at the time of order. Tolerance ± 10%			
Dimensions and Weight			Receiver: 177H × 426W × 450D (mm), ≤ 18.5kg Transmitter: 133H × 426W × 450D (mm), ≤ 13.5kg			

Transmitter

Sweep Output Frequency	Line (50/60Hz), 70Hz Option (select one frequency from 18Hz to 100Hz) Ext. (18Hz to 100Hz)
Ext. Sweep Input (Rear panel)	Frequency 18Hz to 100Hz, Level 2Vp-p, Impedance 10kΩ
Ext. BB Input (Rear panel)	Frequency 60kHz to 15MHz, Level − 7dBm, Impedance 75Ω
IF Center Frequency	Frequency 60MHz to 80MHz, 120MHz to 160MHz, 10kHz resolution panel display Stability, ± 100kHz at 70MHz, ± 200kHz at 140MHz, 5 hrs after 1/2 hr warm-up
Sweep Width	70MHz band 0 to ± 25MHz, 140MHz band 0 to ± 50MHz, 0.1MHz resolution panel display Auto sweep reduction, Mod frequency × 1MHz
FM Deviation	5 to 1000kHz rms, 1kHz resolution panel display
BB Frequency	Low frequency A type 66.666kHz, 200kHz, 400kHz B type 92.593kHz, 277.778kHz, 555.556kHz C type 83.333kHz, 250kHz, 500kHz High frequency 2MHz (A type), 2.4MHz (B/C type), 3.58MHz, 4.43MHz, 5.6MHz, 8.2MHz, 12.39MHz (ME538A B/C) Accuracy Low frequency ± 5Hz High frequency ± 5 × 10⁻⁶

Receiver

Frequency Marker	Slide	Variable-side markers, 70 ± 25MHz, 140 ± 50MHz				
	2MHz Comb + Slide	2MHz Comb markers + Variable-side markers				
	Accuracy	Counter display with resolution 10kHz				
X-Y Recorder Output (Option)	Output	X: 0 to 4V, Y: 0 to 4V, Pen lift: Open, Pen down: Ground				
	Sweep Speed	20 sec and 40 sec				
Phase Detection Capture Range		± 5Hz ≤ 555.556kHz, 5 × 10⁻⁶ ≤ 12.39MHz				
Ext. Sweep Input (Rear panel)		Frequency: 18Hz to 100Hz, Level: 1Vp-p				
BB Output (Rear panel)		− 7dBm/75Ω				
Inherent Noise (IF to IF) (For all models)		Group Delay	Linearity	Differential Phase	Differential Gain	
		66kHz to 93kHz: 0.3ns rms 200kHz to 278kHz: 0.1ns rms 400kHz to 556kHz: 0.05ns rms	0.02% rms	0.05° rms	0.1% rms	Detection Band: 3kHz
		Deviation: 200kHz rms, f_M < 1MHz		Deviation: 500kHz rms, f_M = 5.6MHz		

SECTION 2

PERFORMANCE CHECKS

2.1 INTRODUCTION

It is necessary to check that the equipment meets all the specifications. These checks may be used for inspection after repair of the instrument, after performing the alignment procedure, or for periodic calibration.

If a function fails to operate, go to SECTION 4 or 5.

Performance Checks

(1) Presetting the Rear Panel

(2) IF to IF

(3) BB to BB

(4) IF RETURN LOSS

(5) FREQUENCY DEVIATION

(6) BB RETURN LOSS

(7) BB AMPLITUDE RESPONSE

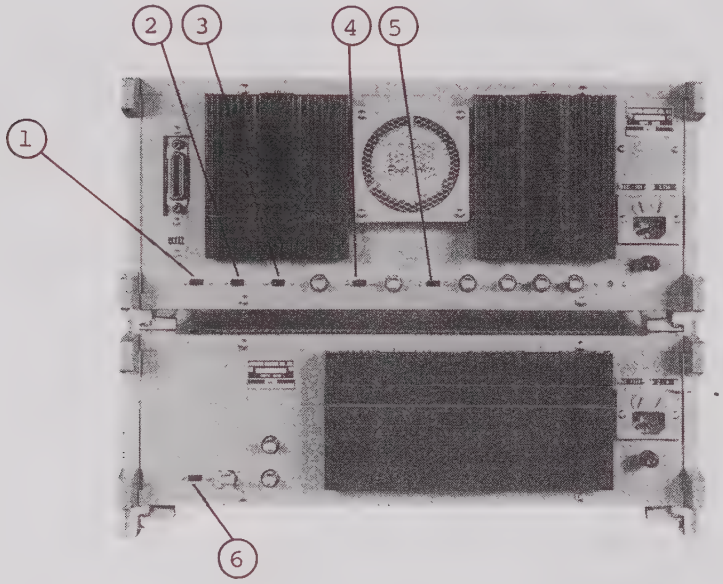
(8) AM/PM CONVERSION COEFFICIENT

2.2 PERFORMANCE CHECKS

Performance checks should be made in compliance with the items (1) to (8) below:

(1) Presetting the Rear Panel

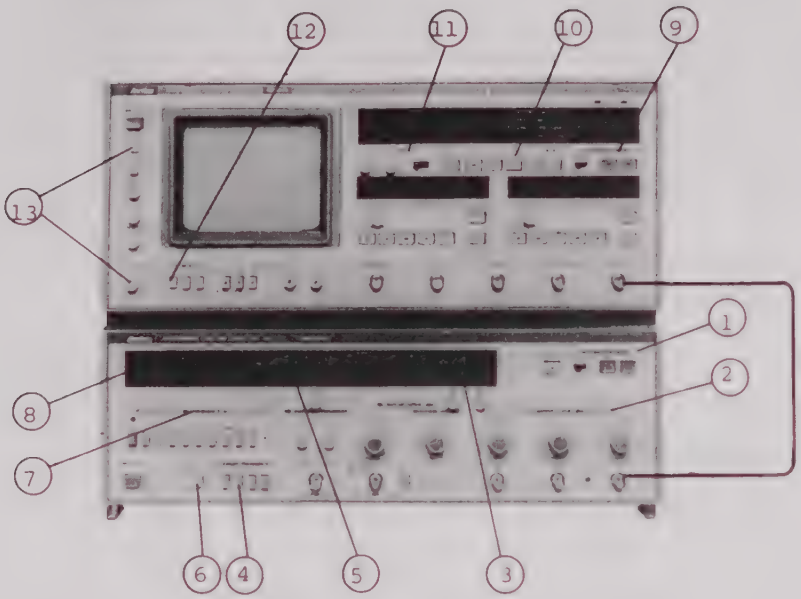
Before carrying out the performance checks, it is necessary to make the presettings explained below.



Set the controls as follows:

(1)	PLL CUT FREQ	HIGH	Set to LOW when sweep frequency is less than 20 Hz.
(2)	CRT TRACE	ALT	Set to CHOP when sweep frequency is less than 20 Hz.
(3)	THRESHOLD EXTENSION	OFF	Set to ON when there is much noise in the IF input signal. However, the modulation frequency must be less than 556 kHz.
(4)	EXT/LINE SELECT	LINE	Set to EXT when using an external sweep signal.
(5)	MARKER SELECT	INT	Set to EXT when using an external frequency marker detector.
(6)	BB FREQ SELECT	INT	Set to EXT when using an external oscillator.

(2) IF to IF



Set the controls as follows:

TRANSMITTER:		
①	TRANSMITTER MODE	
	IF BAND	70 MHz or 140 MHz.
	BB, IF	IF.
②	IF OUTPUT LEVEL dBm	0 dBm.
③	IF CENTER FREQ MHz	70 MHz or 140 MHz.
④	SWEEP FREQUENCY	LINE.
⑤	SWEEP WIDTH ±MHz	25 MHz or 50 MHz/140 MHz BAND
⑥	SWEEP REDUCTION	ON.
⑦	BB FREQUENCY Hz	200 kHz, 278 kHz or 250 kHz for Delay, Linearity Measurement. 5.6 MHz for DG, DP Measurement.
⑧	DEVIATION kHz rms	200 kHz rms for Delay Linearity Measurement. 500 kHz rms for DG, DP Measurement.
RECEIVER:		
⑨	RECEIVER MODE	
	IF BAND	Same as Transmitter.
	BB, IF	IF.
⑩	RANGE	AUTO.
⑪	MARKER	SLIDE, FREQUENCY – Set to ±(25 – BB FREQ.) MHz.
⑫	X SELECT	IF.
⑬	X PHASE	Adjust the knob to make the tracing marker pulses coincide with the retracing marker pulse while the BLANKING is OFF. After adjusting, set the BLANKING switch to ON.

IF LEVEL

If the difference between the IF OUTPUT LEVEL and IF INPUT LEVEL is less than 0.6 dB, IF LEVEL is normal.

IF AMPLITUDE

(a) Y1 selectors AMPL
Y2 selectors OFF

If the item key LEDs light, push these keys again. The LEDs turn off and these functions enter the OFF state.

(b) Confirmation: The slope should be less than ±0.05 dB/±25 MHz.

Note: SLOPE ADJ is used for compensation of the cable characteristics.

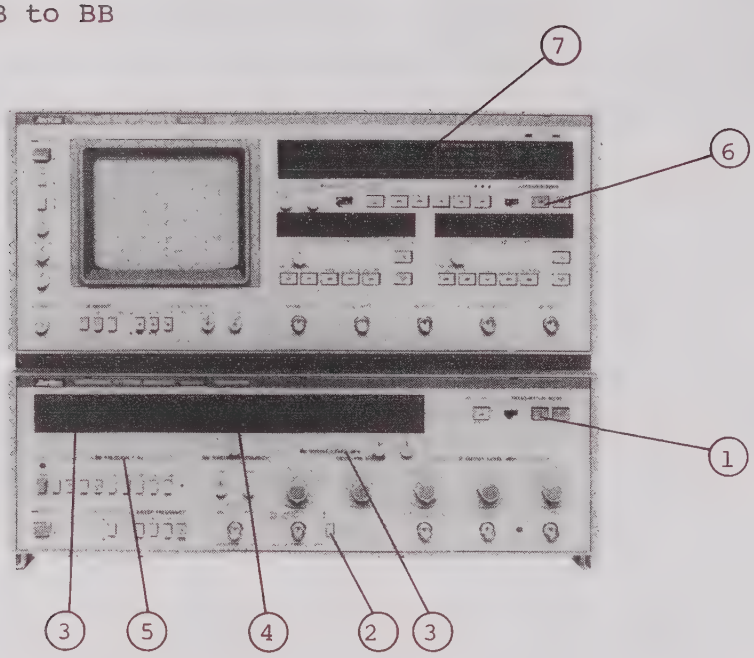
GROUP DELAY & LINEARITY

(a)	(Transmitter) BB FREQ:	Set as follows. Type A 200 kHz. Type B 278 kHz. Type C 250 kHz.
(b)	(Transmitter) DEVIATION:	200 kHz rms.
(c)	Y1 selectors:	DELAY/DP.
(d)	Confirmation:	The slope of the trace should be less than 0.5 ns/70 ±25 MHz, 1 ns/140 ±50 MHz.
(e)	Y2 selectors:	LINEARITY/DG.
(f)	Confirmation:	The slope should be less than 0.2%/70 ±25 MHz, 0.2%/140 ±50 MHz.

Differential Phase & Differential Gain

(a)	(Transmitter) BB FREQ:	Set to 5.6 MHz
(b)	(Transmitter) DEVIATION:	500 kHz rms.
(c)	Y1 selectors:	DELAY/DP.
(d)	Confirmation:	The slope should be less than 0.5°/70 ±(25 - BB FREQ.) MHz 0.8°/140 ±(50 - BB FREQ.) MHz
(e)	Y2 selectors:	LINEARITY/DG.
(f)	Confirmation:	The slope should be less than 0.4%/70 ±(25 - BB FREQ.) MHz, 0.6%/140 ±(50 - BB FREQ.) MHz

(3) BB to BB



Set the controls as follows:

TRANSMITTER:		
(1)	TRANSMITTER MODE	BB.
(2)	(OUTPUT SELECT)	BB OUTPUT ▬
(3)	BB OUTPUT LEVEL dBm	0 dBm.
(4)	SWEEP OUTPUT	zero.
(5)	BB FREQUENCY	Push the keys in sequence, after RECEIVER settings.
RECEIVER:		
(6)	RECEIVER MODE	BB.
(7)	BB LEVEL dBm	Read the level.

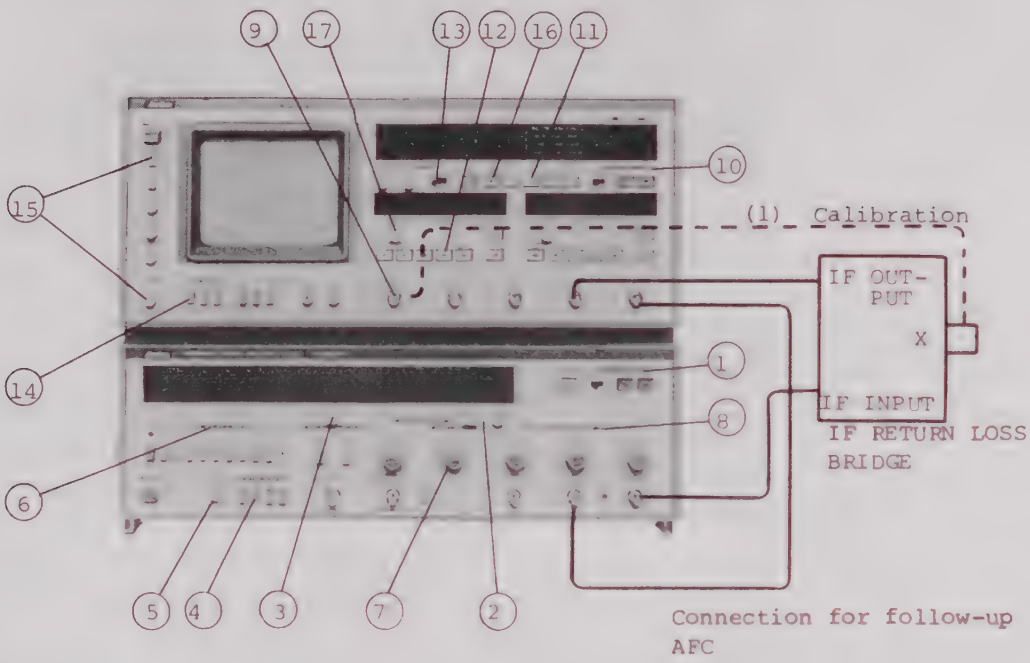
BB LEVEL

If the difference the between BB OUTPUT level and BB LEVEL is less than 0.6 dBm, the BB level is normal.

Other BB to BB characteristics

If the IF to IF characteristics are normal, the BB to BB measurement facilities are also normal.

(4) IF RETURN LOSS



Set the controls as follows:

(1) Calibration of RETURN Loss indicator.

TRANSMITTER:

①	TRANSMITTER MODE	
	IF BAND	70 MHz or 140 MHz
	BB, IF	IF.
②	IF CENTER FREQ	70 MHz or 140 MHz.
③	SWEEP WIDTH	70 MHz BAND: ±25 MHz, 140 MHz BAND: ±50 MHz
④	SWEEP FREQUENCY	LINE.
⑤	SWEEP REDUCTION	ON
⑥	BB FREQUENCY Hz	Less than 1 MHz } These setting are not needed theoretically, but are effective for receiver stability.
⑦	DEVIATION kHz rms	200 kHz rms or less }
⑧	IF OUTPUT LEVEL dBm	+10 dBm.
⑨	Connect the X terminal of the RETURN LOSS BRIDGE to MISSMATCH 20 dB terminal for calibration.	

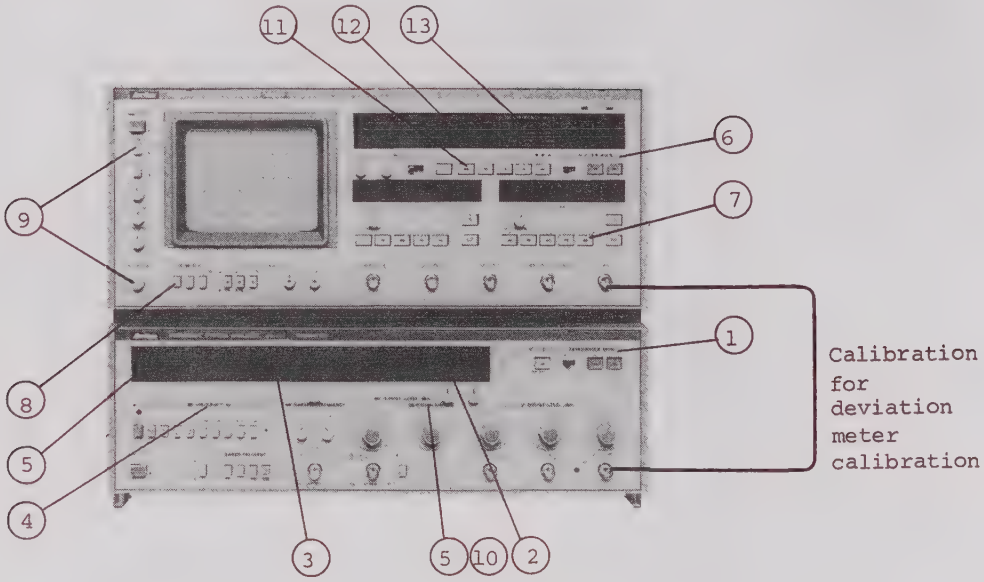
RECEIVER:

⑩	RECEIVER MODE	
	IF BAND	Same as TRANSMITTER
	BB, IF	IF.
⑪	RANGE	AUTO.
⑫	Y2 keys	RET LOSS
⑬	MARKER	SLIDE.
⑭	X SELECT	IF.
⑮	X PHASE, BLANKING	Adjust the knob to make the tracing marker image coincide with the re-tracing marker image while the BLANKING switch is OFF. After adjusting, set the BLANKING switch to ON.
⑯	CAL	Push this key twice. The calibration factor 20 dB is displayed on Y2 panel indicator.
⑰	POSITION	Adjust the 20 dB return loss image on CRT to the center of the Y axis scale as shown below.

Calibration of Return Loss image

Confirmation: Check by refering to the Return Loss in the IF band characteristics in Table 1-1, SPEICFICATIONS.

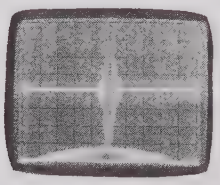
(5) FREQUENCY DEVIATION



Set the controls as follows:

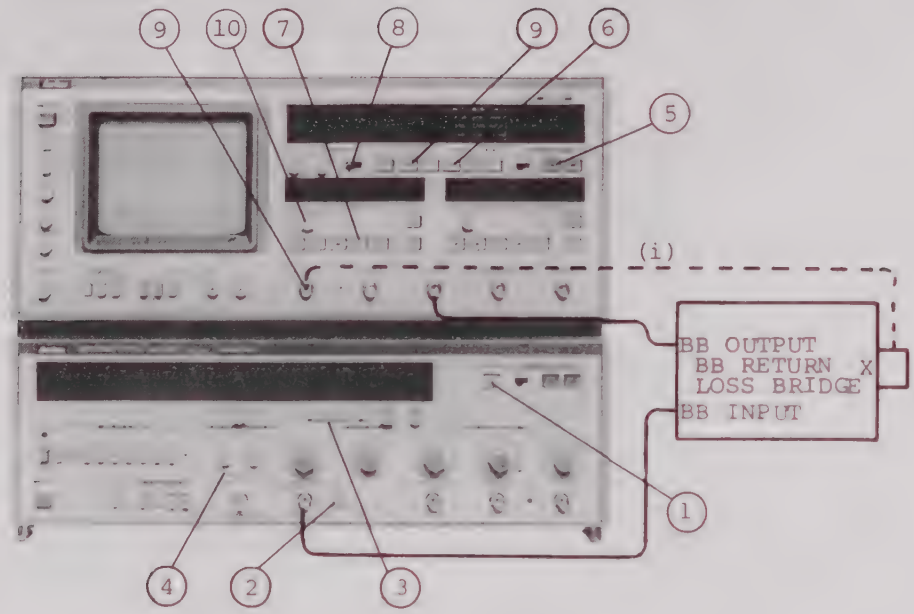
TRANSMITTER:		
①	TRANSMITTER MODE	
	IF BAND	70 MHz or 140 MHz.
	BB, IF	IF.
②	IF CENTER FREQ	70 MHz or 140 MHz.
③	SWEEP WIDTH ±MHz	Zero.
④	BB FREQUENCY	A type – 200 kHz, B type – 278 kHz, C type – 250 kHz.
⑤	DEVIATION kHz rms	Set the deviation to A type – 340 kHz, B type – 472 kHz rms and C type – 425 kHz rms.
RECEIVER		
⑥	RECEIVER MODE	
	IF BAND	Same as Transmitter.
	BB, IF	IF.
⑦	Y2 keys	SPECTRUM.
⑧	X SELECT	IF.
⑨	X PHASE, BLANKING	Adjust the knob to make the trasing spectrum image coincide with the re-tracing spectrum image when the BLANKING switch is OFF.
⑩	DEVIATION dial of TRANSMITTER	Readjust the DEVIATION kHz rms dial of the TRANSMITTER to get the first carrier zero spectrum on the CRT screen.
⑪	CAL	Push this key twice.
⑫	DEVIATION kHz rms CAL	The deviation meter is calibrated with the CAL key ⑪.

Confirmation: Check by refering to the spectrum in Table 1-1, SPECIFICATIONS.



70MHz or 140MHz Marker

(6) BB RETURN LOSS



Set the controls as follows:

TRANSMITTER:

①	BB SWEEPER	Push.
②	(OUTPUT SELECT)	BB OUTPUT ▬
③	BB OUTPUT LEVEL dBm	+5 dBm
④	BB SWEEPER FREQUENCY	After setting the RECEIVER controls, adjust the START, STOP knob while observing the Marker line on the CRT.

RECEIVER:

⑤	RECEIVER MODE	BB.
⑥	RANGE	AUTO.
⑦	Y1 keys	RET LOSS.
⑧	MARKER	SLIDE or 2 MHz COMB + SLIDE. (Do not use these markers, other markers appear as in the following Fig. A).

(i) Connect the X terminal of the BB RETURN LOSS BRIDGE to MISMATCH 20 dB terminal ⑨.

⑨	CAL	Push the key twice. Calibration factor 20 dB is displayed on Y2 panel indicator.
⑩	POSITION	Shift the 20 dB return loss image on the CRT to the center of the Y axis scale as in Fig. A below:

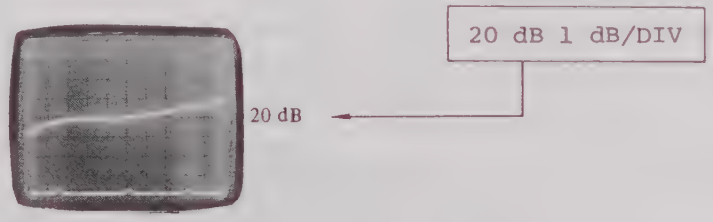


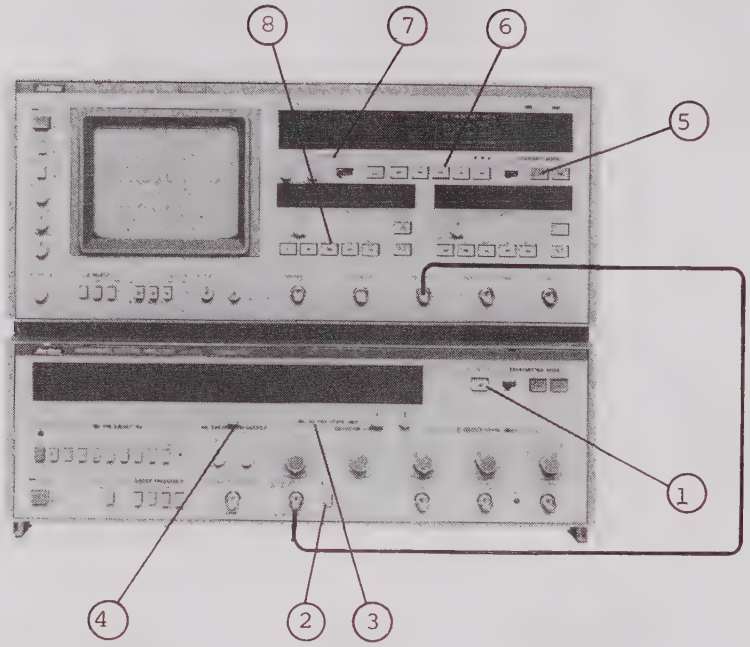
Fig. A

Confirmation: Check the following item

Frequency Range: 100 kHz to 15 MHz

Measuring Range: 10 dB to 40 dB; Accuracy depends on the bridge used.

Sensitivity: 1 dB/div.



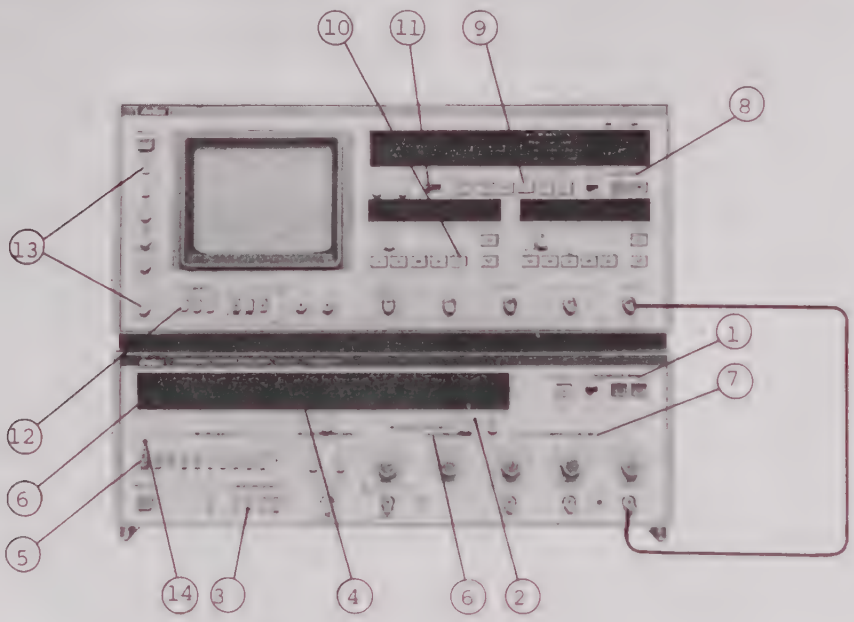
Set the controls as follows:

TRANSMITTER:		
(1)	BB SWEEPER	Push.
(2)	(OUTPUT SELECT)	BB OUTPUT ▬
(3)	BB OUTPUT LEVEL dBm	0 dBm
(4)	BB SWEEPER FREQUENCY	START: 100 kHz STOP : 13 MHz
RECEIVER:		
(5)	RECEIVER MODE	BB.
(6)	RANGE	AUTO.
(7)	MARKER *	SLIDE or 2 MHz COMB + SLIDE.
(8)	Y1 or Y2 keys	AMPL.

Confirmation: Check by refering to the BB AMPLITUDE in Table 1-1, SPECIFICATIONS.

*Note; Marker frequency on CRT

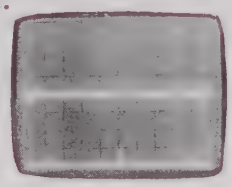
(8) AM/PM CONVERSION COEFICIENT (confirmation of residual PM)



Set the controls as follows:

(1)	Calibration – Minimize the residual AM-PM conversion value. Connect IF OUTPUT terminals directly to the IF INPUT terminal.	
TRANSMITTER:		
①	TRANSMITTER MODE	
	IF BAND	70 MHz or 140 MHz
	BB, IF	IF.
②	IF CENTER FREQ	70 MHz or 140 MHz
③	SWEEP FREQUENCY	LINE.
④	SWEEP WIDTH ±MHz	25 MHz or 35 MHz/140 MHz BAND
⑤	AM-PM	Push. (i) IF OUTPUT signal is AM and FM modulated. (ii) The modulation frequencies are A type – 200 kHz, B type – 278 kHz, C type – 250 kHz. (iii) The AM modulation frequencies are a little larger (500 Hz) than FM modulation frequencies.
⑥	DEVIATION kHz rms	Set to 200 kHz rms.
⑦	IF OUTPUT LEVEL dBm	Required level (–20 dBm to +10 dBm).
RECEIVER:		
⑧	RECEIVER MODE	
	IF BAND	Same as TRANSMITTER.
	BB, IF	IF.
⑨	RANGE	AUTO.
⑩	Y1 keys	AM-PM.
⑪	MARKER	SLIDE.
⑫	X SELECT	IF.
⑬	X PHASE BLANKING	Adjust the knob to make the tracing marker signal coincide with the re-tracing marker signal while the BLANKING switch is OFF.
⑭	AM-PM ADJ	Minimize the amplitude of the beat wave by adjusting this knob, when the amplitude (peak to peak) is more than 0.3°/dB, as shown in Fig. a.

Residual PM.



0.2 °/dB/DIV

Fig. a

Confirmation: Check by refering to the AM to PM Conversion in Table 1-1, SPECIFICATIONS.

SECTION 3

PREPARATION OF REPAIR

3.1 INTRODUCTION

This section will explain method of disassembling the equipment and each unit, and instruments for repair and calibration.

WARNING: Hazardous voltage is present on parts marked:

Do not touch these parts by hand.

3.2 DECOMPOSITION

3.2.1 Decomposition of Transmitter and Receiver

As shown in Fig. 3-1 below, the receiver and the transmitter are locked by 4 legs.

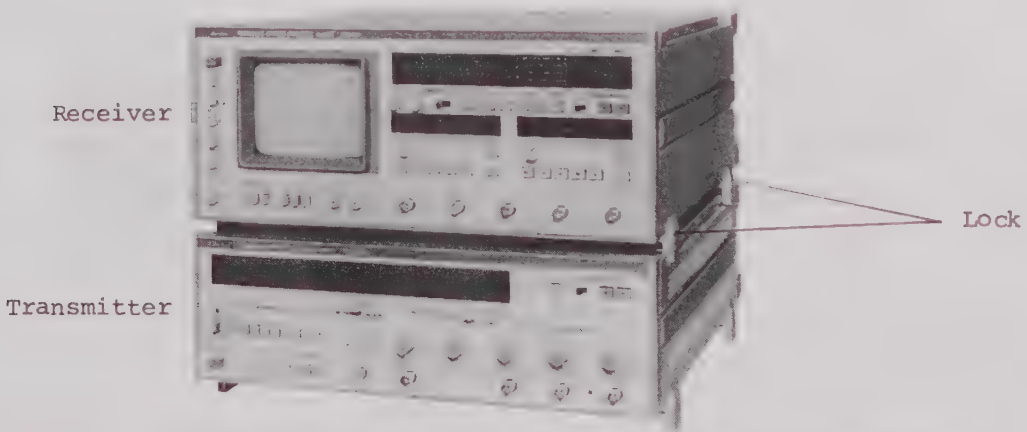


Fig. 3-1 Connection between transmitter and receiver

As shown in the detailed view of Fig. 3-2, the transmitter and the receiver are decomposed by raising the locks.

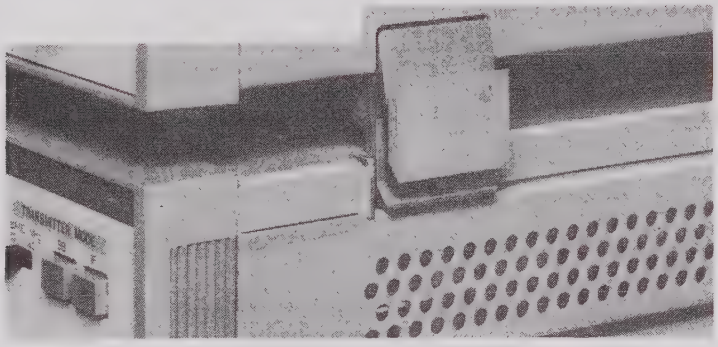


Fig. 3-2 Detailed view of leg

3.2.2 Removing the Outer Cover

(1) Removing top cover and bottom cover

Remove two each of screws of the top cover and bottom cover on the rear, and pull out the covers in the directions as shown in Fig. 3-3.

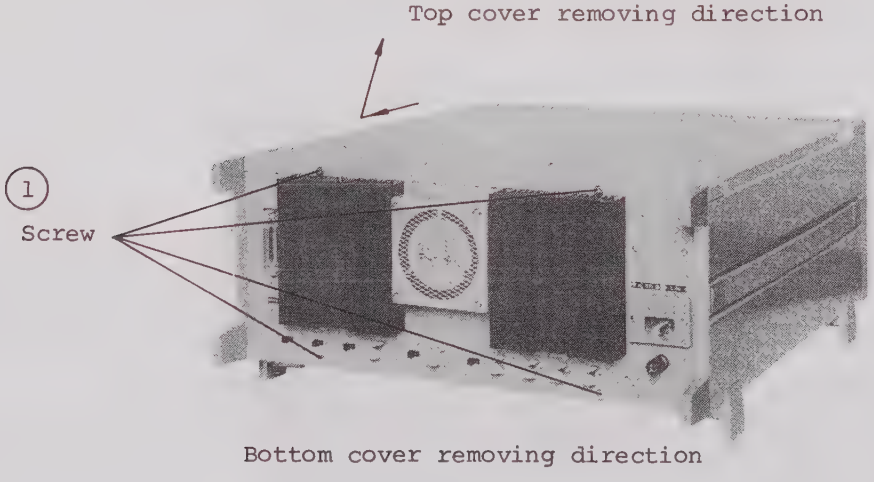


Fig. 3-3 Removing the outer cover

(2) Removing side cover

Open the screw covers as shown in Fig. 3-4: For transmitter, remove two screws (1) and take off the side cover . For receiver, remove two screws (1) and four screws (2), and take off the side cover.

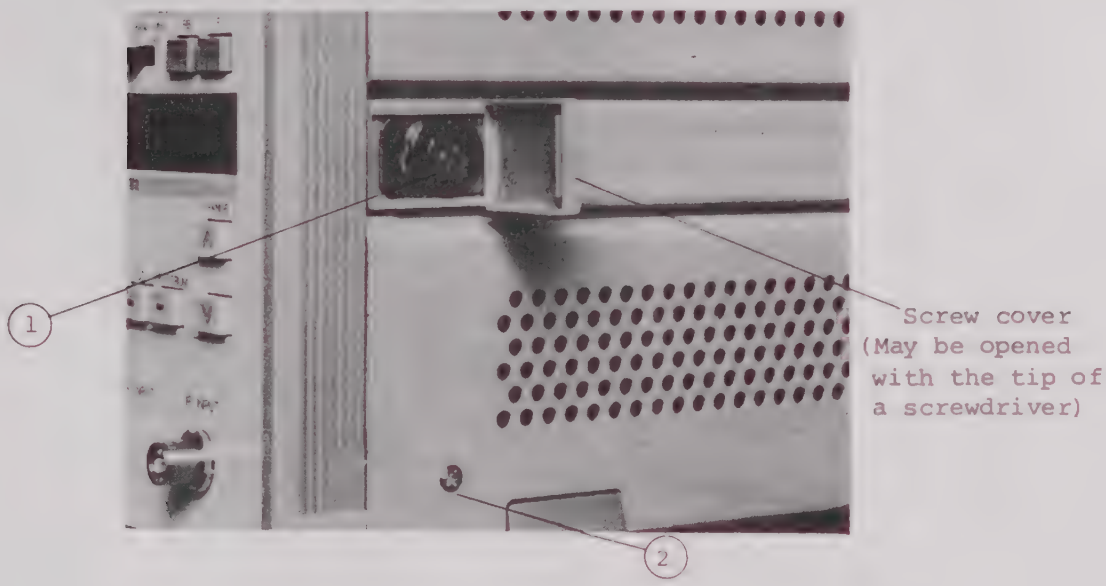


Fig. 3-4 Removing side cover

3.2.3 Removing CRT

The CRT may be removed following the procedures given below (see Fig. 3-5):

(1) Pull back the connector (1) and remove it.

(2) Remove the anode connector (2).

Note: When the connector (2) is removed, contact the electrode with the chassis to discharge the charge.

(3) Remove two screws (3) and remove the clamp

Remove four screws (4) and remove the clamp (front side CRT holding plate).

(4) Lift the CRT backward with left and right waving gently and remove it.

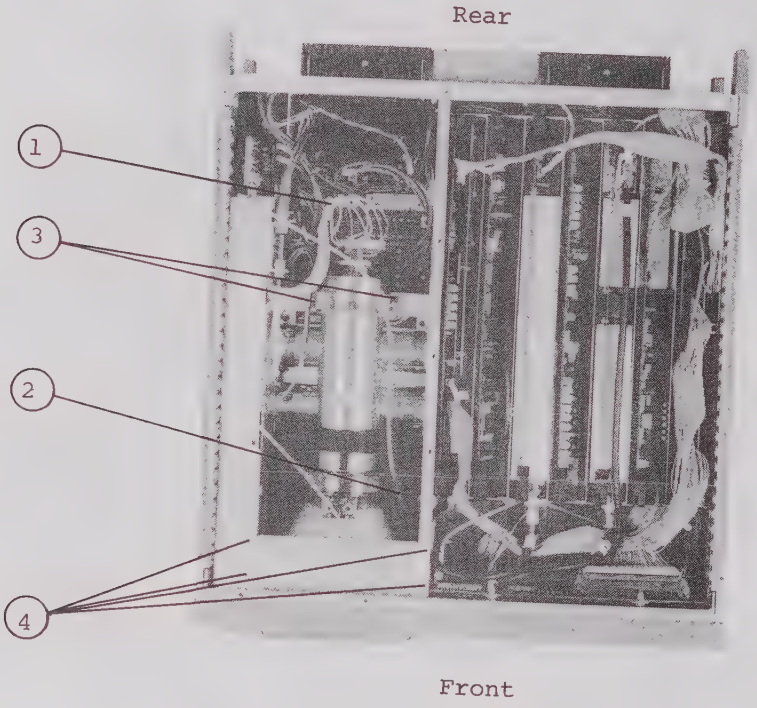


Fig. 3-5 Top view of receiver interior

3.2.4 Disassembly

Table 3-1 Mechanical Parts List (TRANSMITTER)

NO.	PART NO.	DESCRIPTION	REMARKS	Q'ty
①	44E68583	Button		1
②	43H29179A	Button	Model ME453A, ME538A	1
	43H29179F	Button	Model ME453B, ME538B	1
	43H29179L	Button	Model ME453C, ME538C	1
③	43H29179B	Button	Model ME453A, ME538A	1
	43H29179G	Button	Model ME453B, ME538B	1
	43H29179M	Button	Model ME453C, ME538C	1
④	43H29179C	Button	Model ME453A, ME538A	1
	43H29179H	Button	Model ME453B, ME538B	1
	43H29179N	Button	Model ME453C, ME538C	1
⑤	43H29179D	Button	Model ME453A, ME538A	1
	43H29179J	Button	Model ME453B, ME538B	1
	43H29179P	Button	Model ME453C, ME538C	1
⑥	43H29179E	Button	Model ME453A, ME538A	1
	43H29179K	Button	Model ME453B/C, ME538B/C	1
⑦	44E68584A	Button		9
⑧	442E73198	Button	Standard	1
	Sweep freq(*) Hz 43H29179( )	Button	Option 03	1
⑨	442E73198	Button	Model ME453A/B/C	1
	44E68584A	Button	Model ME538A/B/C	1
⑩	44E58248D	Button frame		1
⑪	44E58248C	Button frame		15
⑫	44H74904	Knob	Standard	2
	442E73701A	Knob	Option 01	2
⑬	342E73701B	Knob		1
⑭	342E73701A	Knob		2
⑮	342E73717	Knob		3
⑯	342E73712B	Knob		2
⑰	43B28220D	Plate, BB LEVEL (+10 ∿ -50 dB) control		1
⑱	44B74625A	Plate, BB LEVEL DEVIATION control		1

Table 3-1 Mechanical Parts List (TRANSMITTER) (Cont'd)

NO.	PART NO.	DESCRIPTION	REMARKS	Q'ty
⑲	43B28220C	Plate, IF LEVEL (+10 ∿ -60 dB) control		1
⑳	43B28220B	plate, IF LEVEL (0 ∿ -10 dB) control		1
㉑	44B74625B	Plate, IF LEVEL (+1 ∿ -1 dB) control		1
㉒	442E72263	Button	Standard	1
	442E68581A	Button	Option 01	1
㉓	442E68581A	Button		2
㉔	42B10306	Panel, front	Model ME453A/B/C	1
	42B10305	Panel, front	Model ME538A/B/C	1
㉕	44B74895A	Plate, model	Model ME453A	1
	44B74895B	Plate, model	Model ME453B	1
	44B74895C	Plate, model	Model ME453C	1
	44B74895D	Plate, model	Model ME538A	1
	44B74895E	Plate, model	Model ME538B	1
	44B74895F	Plate, model	Model ME538C	1
㉖	43B27405	Filter		1
㉗	422B10250	Shied cover		1
㉘		Screw		
㉙	43B23734	Cover, plate		2
㉚		Screw		
㉛	43H28312D	Heat sink		1
㉜	43H28312C	Heat sink		1
㉝	44B70418B	Cover		2
㉞		Screw		
㉟	33B22510C	Top cover		1
㊱	33B22458	Bottom cover		1
㊲		Screw		
㊳	33B22470	Side cover		2
㊴	349B73661	Handle		2
㊵		Screw		
㊶	33B20662	Protector		4
㊷	349B73667	Foot		4
㊸		Screw		
㊹	34B78330A	Clamp, Panel		3
㊺	34B78330B	Clamp, Panel		3

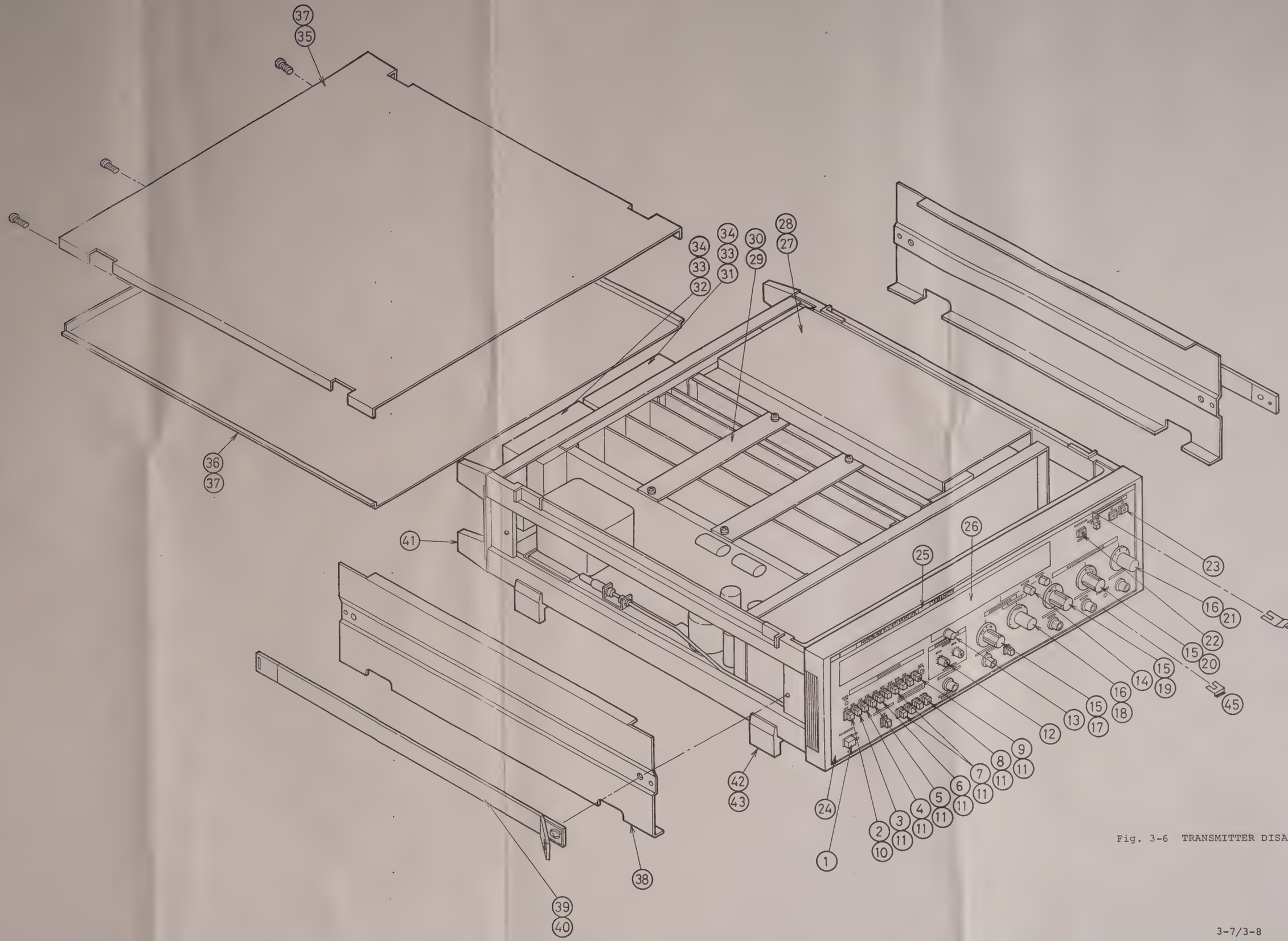


Fig. 3-6 TRANSMITTER DISASSEMBLY

Table 3-2 Mechanical Parts List (RECEIVER)

NO.	PART NO.	DESCRIPTION	REMARKS	Q'TY
①	44E68583	Button		1
②	44E68584A	Button		5
③	44E58248C	Button flame		8
④	342E73701B	Knob		2
⑤	342E73701A	Knob		6
⑥	442E73198	Button	Standard	3
	44E68584A	Button	Option 02	3
⑦	322E7685	Bezel		1
⑧	44H72380	Filter		1
⑨		Screw		
⑩	44H74904	Knob	Standard	2
	342E73701A	Knob	Option 02	2
⑪	43H29173A	Filter	Model ME453A	1
	43H29173B	Filter	Model ME453B	1
	43H29173C	Filter	Model ME453C	1
	43H29173D	Filter	Model ME538A	1
	43H29173E	Filter	Model ME538B	1
	43H29173F	Filter	Model ME538C	1
⑫	44B74893	Spring		2
⑬	442E68581A	Button		15
⑭	44H71717	Filter		2
⑮	442E70855	Button		4
⑯	442E72263	Button		1
⑰	442E68581B	Button		2
⑱	42B10307	Panel front	Model ME453A/B/C	1
	42B10308	Panel front	Model ME538A/B/C	1
⑲	44B74895A	Plate, model	Model ME453A	1
	44B74895B	Plate, model	Model ME453B	1
	44B74895C	Plate, model	Model ME453C	1
	44B74895D	Plate, model	Model ME538A	1
	44B74895E	Plate, model	Model ME538B	1
	44B74895F	Plate, model	Model ME538C	1

Table 3-2 Mechanical Parts List (RECEIVER) (Cont'd)

NO.	PART NO.	DESCRIPTION	REMARKS	Q'TY
⑳	44B73002	Clamp		1
㉑	34E67754B	Rubber spacer		1
㉒		Screw		
㉓	34B69913D	Shield cylinder		1
㉔	44B64313	Clamp		2
㉕	34E67754D	Rubber spacer		2
㉖		Screw		
㉗	43B29174	Cover plate		1
㉘		Screw		
㉙	43H28312	Heat sink		2
㉚	44B70418A	Cover		2
㉛		Screw		
㉜	44B74894	Cover for fan		1
㉝		Screw		
㉞	33B22452	Top Cover		1
㉟	43B29185	Bottom Cover		1
㊱		Screw		
㊲	43B29186	Left side cover		1
㊳	33B22472	Right side cover		1
㊴		Screw		
㊵	349B73661C	Handle		2
㊶		Screw		
㊷	33B20662	Protector		4
㊸	349B73667	Foot		4
㊹		Screw		
㊺	43H28311	Protective plate		1
㊻	44N69391	Label		1
㊼		Screw		
㊽	34B78330A	Clamp, panel		3
㊾	34B78330B	Clamp, panel		3

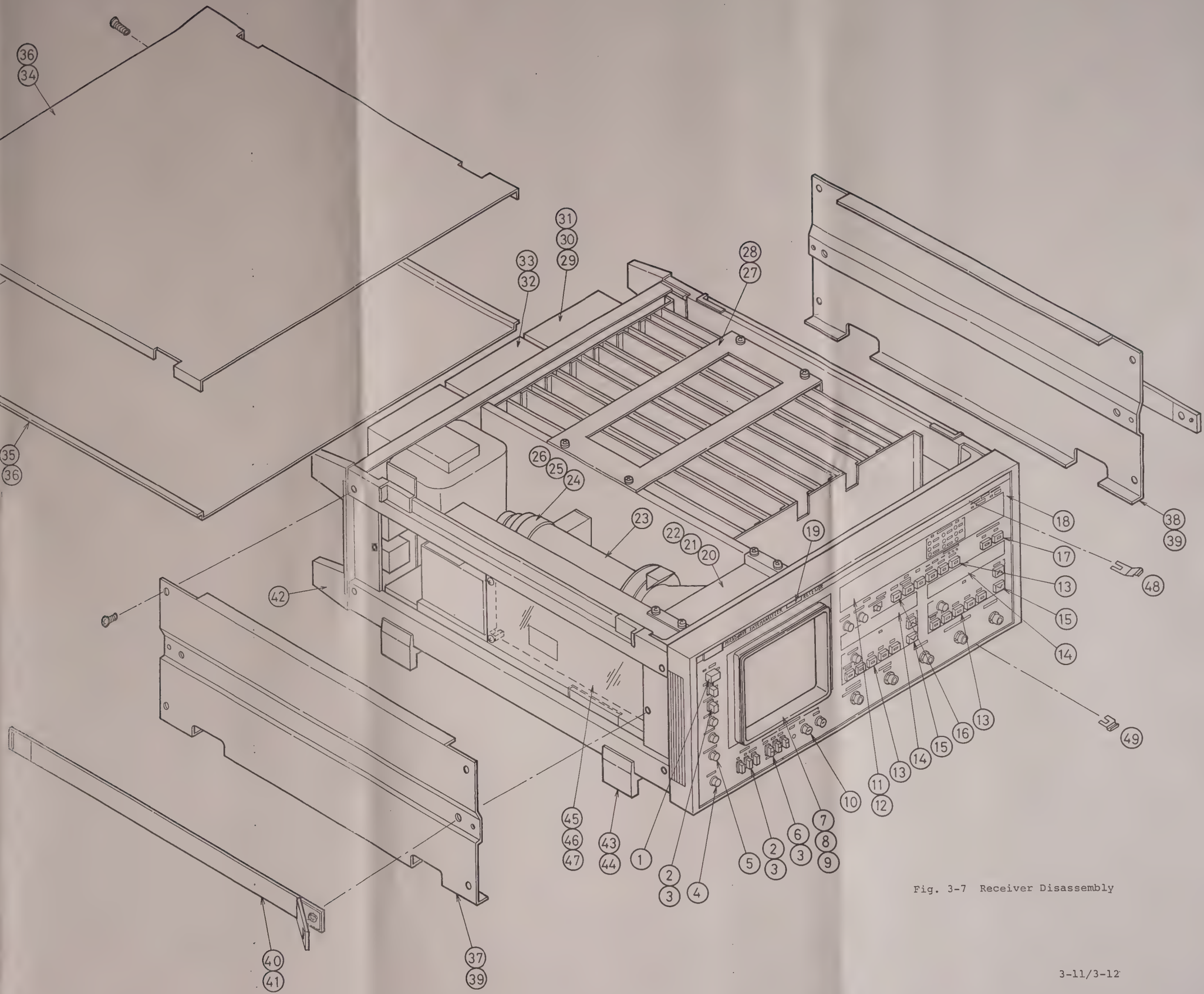


Fig. 3-7 Receiver Disassembly

3.3 Instruments and Accessories Required for Calibration, Adjustment, Troubleshooting and Repair

3.3.1 Instruments

Table 3-3 Instruments Required for Calibration, Adjustment, Troubleshooting and Repair

Test Instrument	Required Performance	Recommended Model
OSCILLO SCOPE	DC to 50 MHz	
ELECTRONIC VOLTMETER	DC to 1 GHz	ML69A (Anritsu)
DIGITAL VOLTMETER	0.1 mV to 100 V	
STANDARD LEVEL METER	DC to 500 MHz, 75Ω	ML59B (Anritsu)
FREQUENCY SYNTHESIZER	10 kHz to 500 MHz, 75Ω	MG545M (Anritsu)
FREQUENCY COUNTER	10 Hz to 1 GHz	MF63A (Anritsu)
SPECTRUM ANALYZER	50 Hz to 1.7 GHz	MS62C (Anritsu)
RETURN LOSS MEASURING SET	3 kHz to 1.5 MHz/75Ω 1 MHz to 500 MHz/75Ω	MR31A (Anritsu) MR52B (Anritsu)

3.3.2 Accessories

(1) Extender board

pc board 432U29286

Connector 225J-22221-587 (DDK)

The extender board is mounted in the receiver unit as a standard component (or attached).

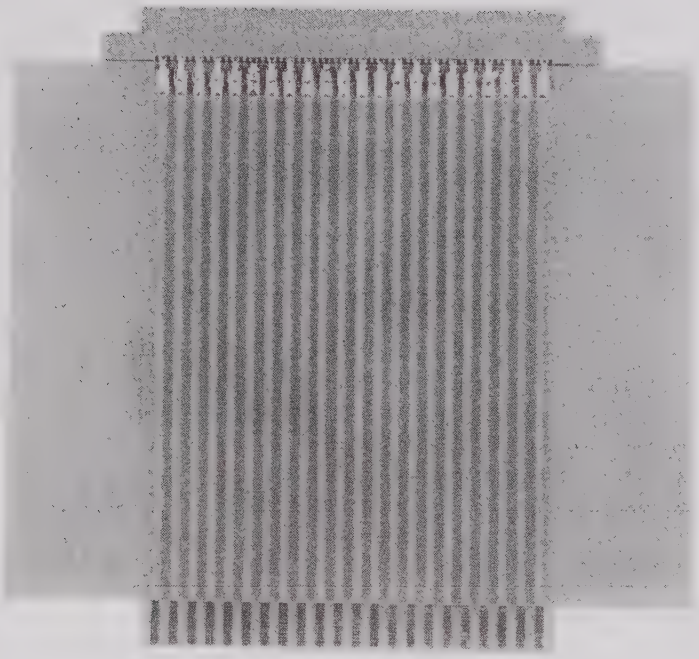


Fig. 3-8 Extender Board

(2) Service kit

This kit is used when checking the internal characteristics of this equipment.

Table 3-4 Service Kit (44Y75388)

No.	Description	Q'ty	SPEC. No.
1	BNC-A611 (BNC-A-JJ75) adapter	1	No. 1289
2	BNCJ-UMP (27DP/NSJ) adapter	2	No. 1305
3	27DP-P-1.5 cable (10 cm)	2	449J75994
4	PI011-2F - OPEN cable (40 cm)	2	449J75995 □ J1:A, J2:B

SECTION 4

CALIBRATION AND ADJUSTMENT

4.1 INTRODUCTION

This section explains the methods by which the output level is set for each unit and describes the input calibration for the level meter.

Internal Deviation:

Because the amplifier and the mixer of the present measuring equipment are designed for wide bands, the equipment is not equipped with equalizers for Delay (DP), Linearity (DG), AMPL, and Return Loss. When problems with components occur, a loose contact in the printed circuit boards, cable, etc. can cause an increase in internal deviation. Consequently, calibration is unnecessary.

Calibration of Delay (DP), Linearity (DG), Ampl:

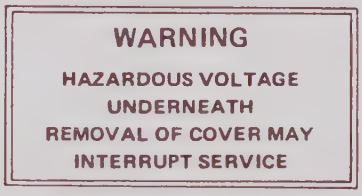
The accuracy of these calibrations does not vary unless parts are damaged or surrounding circuits deteriorated. Therefore, as a rule, it is not necessary to make calibrations. In a problem occurs, replace the faulty part in compliance with the procedures explained in Section 5.

4.1.1 General Maintenance

Table 4-1 General maintenance

Check	Period	Procedure
Dirt	• Before storing for an extended period of time	Wipe off with industrial cleaning solvent
Dust, etc.	• When used in a dusty environment • When dirt is noticeable	Remove the cover and blow out with compressed air
Lubrication	Unnecessary	
Loose knobs screws	When found	Retighten

WARNING: Hazardous voltage is present on parts marked:



Do not touch these parts by hand.

4.2 TRANSMITTER

The transmitter will appear as shown in Fig. 4-1 when its top cover is removed (see paragraph 3.2.2). Some calibration items may be adjusted from the top using a screwdriver. However, the calibration variable resistors for some calibration items are located inside the pc board and, therefore, they must be adjusted using the extender board with the pc board out of the cabinet. Since the extender board is incroporated in the receiver unit, it must be taken out, when needed, by first removing the top cover of the receiver. The extender board is provided as an accessory for some models.

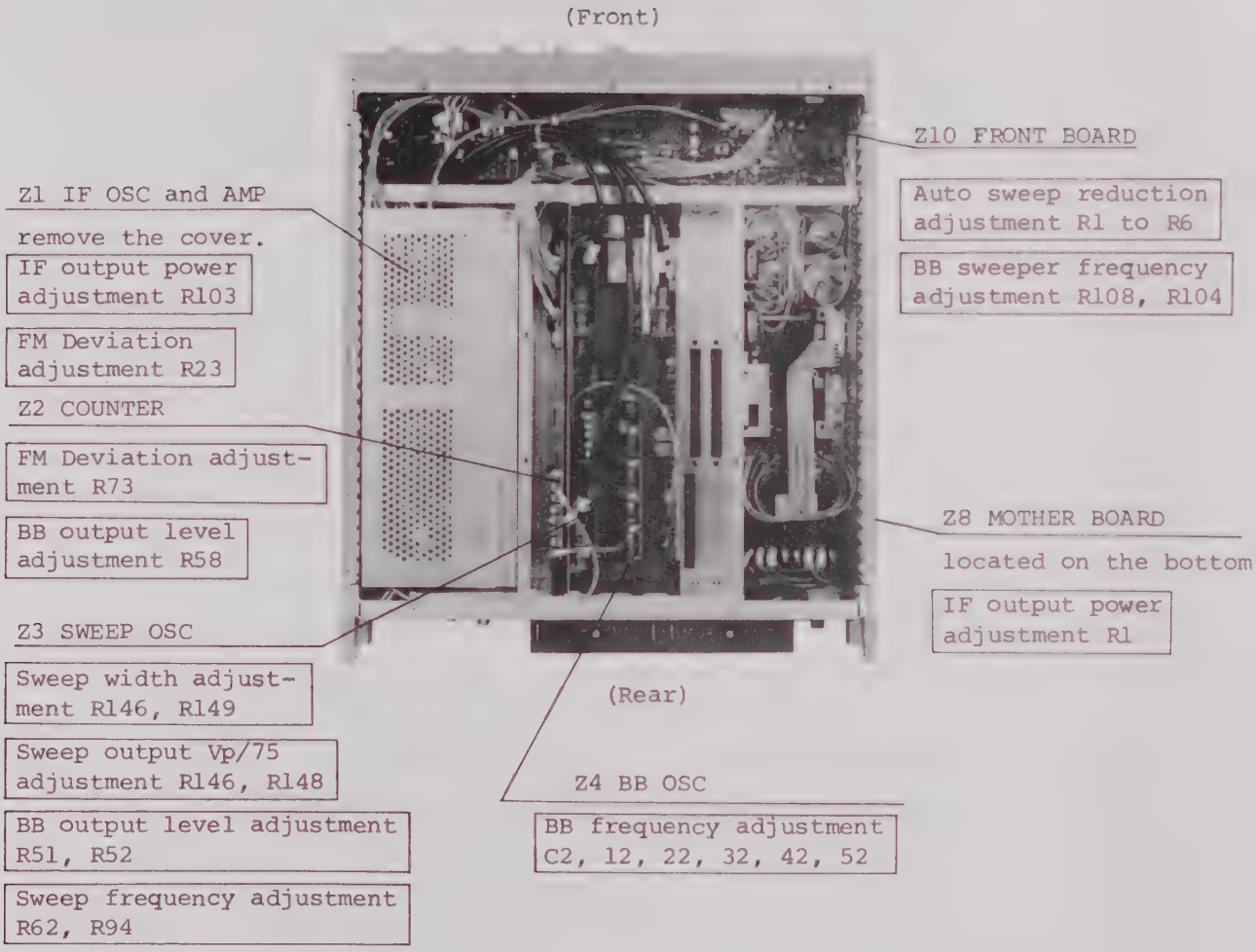

(Front)
Z10 FRONT BOARD
Auto sweep reduction adjustment R1 to R6
BB sweeper frequency adjustment R108, R104
Z1 IF OSC and AMP
remove the cover.
IF output power adjustment R103
FM Deviation adjustment R23
Z2 COUNTER
FM Deviation adjustment R73
BB output level adjustment R58
Z8 MOTHER BOARD
located on the bottom
IF output power adjustment R1
Z3 SWEEP OSC
Sweep width adjustment R146, R149
Sweep output Vp/75 adjustment R146, R148
BB output level adjustment R51, R52
Sweep frequency adjustment R62, R94
(Rear)
Z4 BB OSC
BB frequency adjustment C2, 12, 22, 32, 42, 52

Fig. 4-1 Internal View of Transmitter (Top View)

4.2.1 IF OUTPUT Power

(1) Set the sweep width and FM deviation to zero.

(2) Set the IF output level dial to 0 dBm and connect the power meter to the IF OUTPUT terminal.

(3) Set the vernier dial to +1.0 (dB), and adjust the variable resistor R103 on Z1 (see 5.2.3) so that the power meter indicates +1.0 dBm.

(4) Set the vernier dial to -1.0 (dB), and adjust the variable resistor R1 on Z8 mother board (see 5.2.8) so that the power meter indicates -1.0 dBm.

(5) Repeat steps (3) and (4) two or three times, and make necessary adjustments so that the vernier dial and IF output power coincide with each other.

4.2.2 SWEEP WIDTH ±MHz

(1) Turn the adjust knob fully counterclockwise and confirm that the indication is "0.0". If "0.0" indication cannot be obtained in this manner, use variable resistor R146 on Z3 (OFFSET) (see 5.2.5).

(2) Connect the IF OUTPUT terminal to the IF INPUT terminal, and turn the adjust knob so that the sweep width is ±20 MHz using the SLIDE MARKER function. Confirm that the LED indicator reading is within "20.0" ±10% at this time. If a different indication is obtained, adjust the variable resistor R149 on Z3 (see 5.2.5) so that the LED indicator reading is "20.0".

Note: This adjustment must be made with the SWEEP REDUCTION switch set in the OFF position.

4.2.3 SWEEP OUTPUT Vp/75Ω

(1) Turn the adjust knob fully counterclockwise and confirm that the indication is "0.00". If "0.00"

indication cannot be obtained in this manner, use variable resistor R146 on (OFFSET) (see 5.2.5).

(2) Terminate the BB+SWEEP OUTPUT terminal by the 75Ω resistor and observe the voltage of this terminated resistance with an oscilloscope. Turn the adjust knob clockwise to align the voltage on the oscilloscope with 2.0 V peak and confirm that the LED indicator reading at this time is within "2.00" ±10%. If a different LED indicator reading is obtained, adjust it to "2.00" using the variable resistor R148 on Z3 (see 5.2.5).

4.2.4 BB OUTPUT Level

This adjustment is delicate and should be carried out with care.

Adjustment of continuous dial

(1) Adjustment of variable width: Connect the level meter which is covered BB band to the BB OUTPUT terminal. Vary the continuous dial within the range of 0 to -10 (dB) and confirm that the indicated value on the power meter varies 10 dB. If a different value is obtained, adjust R51 on Z3 (see 5.2.5) so that its indicated value varies 10 dB.

(2) Then, set the step dial to "0 dBm" and the continuous dial to "0 dB", and adjust the variable resistor R52 on Z3 (see 5.2.5) so that the power meter indicates 0 dBm.

Adjustment of numerical LED

(3) Confirm that the LED indicator reading is within 0 dBm ±0.3 dB when the power meter reading is 0 dBm. If a different value is obtained, adjust the LED indicator reading to 0 dBm using the variable

resistor R58 on Z2 (see 5.2.4).

4.2.5 FM DEVIATION

(1) Set the FM DEVIATION dial to 1000 kHz rms, and adjust the variable resistor R73 on Z2 (see 5.2.4) so that the LED indicator for DEVIATION indicates "1000".

(2) Then, set the DEVIATION LED indicator and the BB FREQ with the FM DEVIATION dial as shown in the table below, and connect the IF OUTPUT terminal to the IF INPUT terminal. The measuring item of the receiver shall be SPECTRUM.

Model	BB FREQ	LED indication
A	200 kHz	340 kHz rms
B	277.778 kHz	472 kHz rms
C	250 kHz	425 kHz rms

(3) Adjust the BB signal level using the variable resistor R23 on Z1 (see 5.2.3) so that the spectrum on the receiver CRT is first carrier zero (2.405 radians).

4.2.6 IF CENTER FREQ

Since the center frequency is counted and displayed on the internal frequency counter, it need not be calibrated.

4.2.7 BB FREQUENCY

(1) Since the frequency of the BB OSC of less than 556 kHz sufficiently satisfies the specification, no calibration is required.

(2) If the frequency of the high frequency OSC deviates

from the specification, make a necessary adjustment using the following variable capacitance on Z4 (see 5.2.6).

2 MHz or 2.4 MHz	:	C52
3.58 MHz	:	C42
4.43 MHz	:	C32
5.6 MHz	:	C22
8.2 MHz	:	C12
12.39 MHz	:	C2

4.2.8 SWEEP REDUCTION

If the reduction sweep width of the auto sweep reduction function is abnormal, make a necessary adjustment using the following variable resistors on Z10 (see 5.2.10):

2 MHz or 2.4 MHz	:	R1
3.58 MHz	:	R2
4.43 MHz	:	R3
5.6 MHz	:	R4
8.2 MHz	:	R5
12.39 MHz	:	R6

4.2.9 SWEEP FREQUENCY

The frequency of the sweep OSC may be adjusted using the following variable resistors on Z3 (see 5.2.5) block:

70 Hz	:	R62
Optional sweep frequency	:	R94

4.2.10 BB SWEEPER FREQUENCY

This adjustment should be made with care because an excessively wide variable range may result in an unstable operation.

(1) START frequency: Set the minimum value 60 kHz while observing the BB AMPL frequency marker of the receiver.
Turn the START knob fully counterclockwise and adjust the variable resistor R108 on Z10 (see 5.2.10) so that the 60 kHz frequency marker appears at left end on the receiver CRT.

(2) STOP frequency: Turn the STOP knob fully clockwise and adjust the variable resistor R104 on Z10 (see 5.2.10) so that the 15 MHz marker appears.

4.3 RECEIVER

When the top cover of the receiver is removed (see paragraph 3.2.2), the receiver will appear as shown in Fig. 4-2. Some calibration items may be adjusted from the top with a screwdriver, and some must be adjusted with the extender (should be taken out of the receiver unit by removing the fixing screws) with the pc board out of the cabinet.

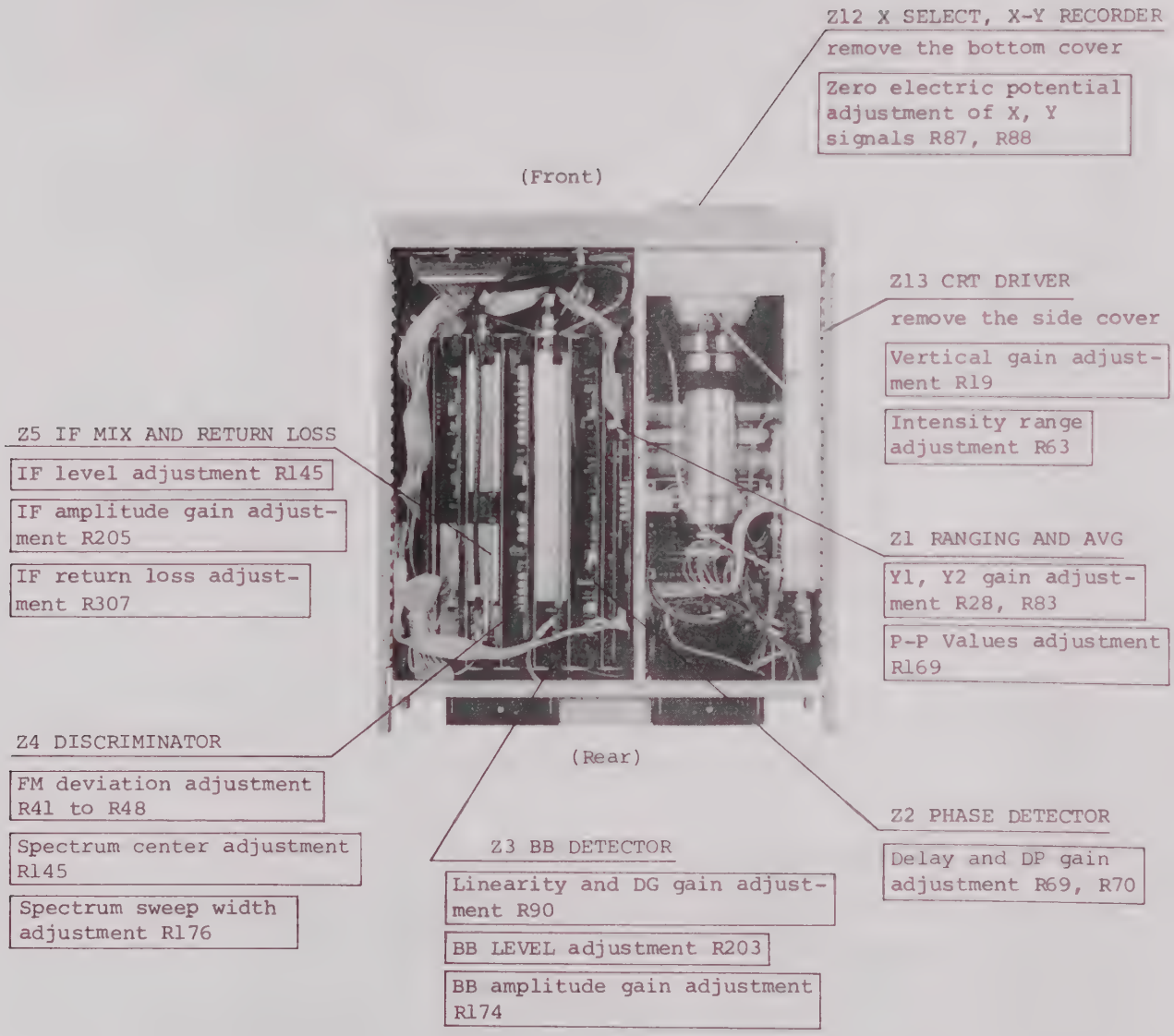

Z12 X SELECT, X-Y RECORDER
remove the bottom cover
Zero electric potential adjustment of X, Y signals R87, R88
(Front)
Z13 CRT DRIVER
remove the side cover
Vertical gain adjustment R19
Intensity range adjustment R63
Z5 IF MIX AND RETURN LOSS
IF level adjustment R145
IF amplitude gain adjustment R205
IF return loss adjustment R307
Z1 RANGING AND AVG
Y1, Y2 gain adjustment R28, R83
P-P Values adjustment R169
Z4 DISCRIMINATOR
FM deviation adjustment R41 to R48
Spectrum center adjustment R145
Spectrum sweep width adjustment R176
(Rear)
Z2 PHASE DETECTOR
Delay and DP gain adjustment R69, R70
Z3 BB DETECTOR
Linearity and DG gain adjustment R90
BB LEVEL adjustment R203
BB amplitude gain adjustment R174

Fig. 4-2 Internal View of Receiver (Top View)

4.3.1 IF LEVEL dBm

(1) Input the IF signal whose frequency is 70 MHz or 140 MHz and power is +4.0 dBm, and confirm that the LED indicator reading is within 4.0 dBm ±0.3 dB.

(2) If the LED indicator reading is other than the value indicated above, adjust it to "4.0" using the variable resistor R145 on Z5 (see 5.3.7).

4.3.2 SLIDE MARKER

Since the frequency of the SLIDE MARKER is counted and displayed on the internal frequency counter, no calibration is required.

4.3.3 BB LEVEL dBm

(1) Input the BB signal whose frequency is approximately 200 kHz (one frequency within the range of 50 kHz to 15 MHz) and power is 0.0 dBm to the BB input terminal.
Confirm that the LED indicator reading at this time is within 0 dBm ±0.3 dB.

(2) If a value other than that indicated above is obtained, adjust the LED indicator reading to "0.0" using the variable resistor R203 on Z3 (see 5.3.5).

4.3.4 DEVIATION kHz rms

A warm-up period of approximately 30 minutes is required prior to this calibration.

(1) When the first carrier zero is displayed on the CRT using the SPECTRUM function, the FM deviation of the IF INPUT signal will be as shown in the table below.

Low BB Frequency	First carrier zero deviation kHz rms	Z4 adjuster
66.666 kHz	133	R41
200 kHz	340	R42
400 kHz	680	R43
92.593 kHz	157	R41
277.778 kHz	472	R42
555.556 kHz	945	R43
83.333 kHz	142	R41
250 kHz	425	R42
500 kHz	850	R43

Confirm that the difference of the LED indicator reading of the deviation is within ±10% of the above values. Otherwise, make necessary adjustments using variable resistors R41 through R43 (see the above table) on Z4 (see 5.3.6).

Note : This calibration is required as an adjustment prior to using the deviation CAL function. Therefore, if the "CAL" marker appears near the LED indicator, the power source should be turned OFF to erase the "CAL" marker and then the adjustment should be carried out again.

(2) The best way to calibrate the high BB frequency deviation is to use the IF signal source which has a stable FM deviation value. If it is not available, then use the IF signal of the transmitter. Press the transmitter BB frequency select switches sequentially, and adjust the high frequency deviation reading to match the low frequency deviation using the variable resistors shown in the table below.

High BB frequency	Z4 deviation adjuster
2 or 2.4 MHz	R44
3.58 MHz	R45
4.43 MHz	R46
5.6 MHz	R47
8.2 MHz	R48

4.3.5 Adjustment of Scale Sensitivity

For each of the delay, DP, linearity, DG, and BB ample measuring items, two trace lines will appear on the CRT when the CAL key is pressed. Align this CAL split trace line with the scale.

(1) Gain of Y axis amplifier for the CRT may have been deviated if the CAL split trace line of each of the above measuring items deviates in an equal proportion. Make a necessary adjustment using the variable resistor R19 on Z13 (see 5.3.14) in such case.

(2) If the scale sensitivity of Y1 and that of Y2 differ from each other, make a necessary adjustment using the variable resistor R23 or R83 on 5.3.3 Z1 (see 5.3.3).

(3) Delay

The split trace line of 10 ns will appear on the CRT when the CAL switch is pressed. Align the split trace to 5 DIV using the variable resistor R70 on Z2 (see 5.3.4), with the RANGE select set to 2 ns/DIV.

(4) DP

The 1 degree split trace line will appear on the CRT when the CAL switch is pressed. Align the

split trace line with 5 DIV using the variable resistor R69 on Z2 (see 5.3.4), with the RANGE select set to 0.2 DEG/DIV.

(5) Linearity and DG

The 10% split trace line will appear on the CRT when the CAL switch is pressed. Align the split trace line to 5 DIV using the variable resistor R90 on Z3 (see 5.3.5), with the RANGE select set to 2%/DIV. The scale sensitivity of the BB amplitude may be deviated as a result of this adjustment. Therefore, the scale sensitivity must be checked.

(6) BB AMPLITUDE (Option)

The split trace line of 1 dB will appear on the CRT when the CAL switch is pressed. Align the split trace to 5 DIV using the variable resistor R174 on Z3 (see 5.3.5), with the RANGE select set to 0.2 dB/DIV.

(7) BB RETURN LOSS (Option)

Since the BB RETURN LOSS shares the same circuit with the BB amplitude, the sensitivity may also be adjusted in accordance with item (6) above.

(8) IF AMPLITUDE

Connect the IF INPUT terminal to the IF OUTPUT terminal and set the RANGE to 1 dB/DIV. Vary the attenuator of the transmitter by 2 dB, and confirm that the trace line on the CRT deviates by 2 divisions. If not, make a necessary adjustment using the variable resister R205 on Z5 (see 5.3.7) so that the trace line shifts 5 divisions.

4.3.6 Centering of SPECTRUM

If the spectrum image on the CRT is not at the center of the horizontal axis, it must be centered.

When the spectrum image is at the center of the horizontal axis, it means that the intermediate frequency the receiver is accurately 17.8 MHz.

(1) Input a signal of approximately 70 MHz or 140 MHz to the IF INPUT and activate the SPECTRUM function.

(2) Then, adjust the variable resistor R145 on Z4 (see 5.3.6) so that the carrier spectrum on the CRT comes to the center of the horizontal axis.

4.3.7 SPECTRUM SWEEP WIDTH

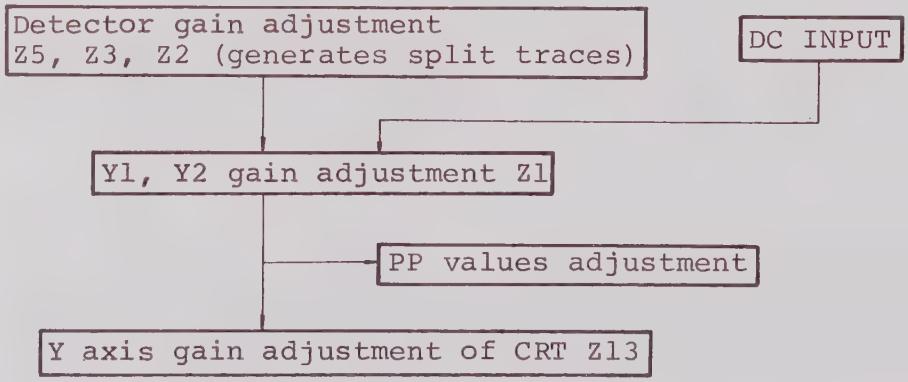
The spectrum sweep width is normally set to approximately ±700 kHz, which may be varied using the variable resistor R176 on Z4 (see 5.3.6).

4.3.8 P-P

If the amplitude on the CRT and the P-P value indicated on the LED are different adjust R169 on Z1 (see 5.3.3) so that the P-P value is equal to the amplitude on the CRT.

Note: Sensitivity adjustment

Gain may deviate as a result of gain adjustment of each PC board as shown in the following diagram. Therefore, care should be exercised in selecting the PC board to be adjusted and the adjustment result.


Detector gain adjustment
Z5, Z3, Z2 (generates split traces)
DC INPUT
Y1, Y2 gain adjustment Z1
PP values adjustment
Y axis gain adjustment of CRT Z13

4.3.9 X-Y RECORDER OUTPUT

CAL

Align the CAL position indicating the range to be traced on the X-Y recorder with the top end and bottom end of the CRT scale, using the variable resistor R45 on Z12 (see 5.3.13).

Zero electric potential

Align the left lower part with zero electric potential using the following variable resistors:

X: R87 (Z12)

Y: R88 (Z12)

4.3.10 INTENSITY

Brightness at the maximum of the INTENSITY may be varied by adjusting the variable resistor R63 on Z13 (see 5.3.14). However, it should be noted that an optimum focus may not be obtained with an excessive brightness.

SECTION 5

TROUBLESHOOTING AND REPAIR

5.1 INTRODUCTION

This section describes how to repair the transmitter and the receiver which compose the microwave system analyzer.

Section 5.2 describes composition of the transmitter, troubleshooting for locating the faulty place from the fault phenomenon, and individual circuits.

Section 5.3 describes the same topics about the receiver.

Individual circuits are described for each PC board. When a failure occurs on the equipment, the faulty PC board is located as follows:

(1) Failure of transmitter

See Paragraph 5.2.2 Troubleshooting the Transmitter.

(2) Failure of Receiver

See paragraph 5.3.2 Troubleshooting the Receiver

Then, the required repair is made referring to the circuit description, waveform and level shown in the circuit diagram of the faulty PC board.

The fuses used in this equipment are shown in Table 5-1.

Table 5-1 List of Fuse

Item	Units	Current	Q'ty	Name	Remarks
1	Transmitter	2A	2	MF51NN250V2AAC05	see 5.2.1 F1,F2
2	Receiver	3A	2	MF51NN250V3AAC05	see 5.3.1 F1,F2
3	Receiver Z14 Power Supply				
	(1) +5 V (Digital)	2A	1	MF51NN25V2ADC01	see 5.3.15 F1
	(2) +5 V (Analog)	2A	1	MF51NN25V2ADC01	see 5.3.15 F2
	(3) +12 V	2A	1	MF51NN25V2ADC01	see 5.3.15 F3
	(4) -12 V	2A	1	MF51NN25V2ADC01	see 5.3.15 F4

5.2 TRANSMITTER

5.2.1 General

The transmitter unit consists of the IF signal generator section, BB signal generator section, and SWEEP signal generator section.

IF signal generator section has the FM modulation and sweep functions, which generates the swept signal of 70 MHz or 140 MHz band.
The IF signal generator section also has a stable built-in crystal oscillator of 70 MHz or 140 MHz.

BB signal generator section generates highly stable BB signals using a crystal oscillator and also generates BB+SWEEP signals by synthesizing SWEEP signals.

SWEEP signal generator section generates signals for sweeping the IF signals.
The block diagram is shown in Fig. 5-5.
The circuit consists of 9 PC boards, Z1 through 5 and Z8 through Z11 each of which has the following functions:

Z1: IF OSCILLATOR AND AMPLIFIER generates signals of 70 MHz band or 140 MHz band.

Z2: COUNTER is the circuit which counts the IF

center frequency and displays the FM deviation sweep width, BB level, and sweep level.

Z3 SWEEP OSCILLATOR AND BB AMPLIFIER consists of the ALC LOOP for stabilizing the BB signal level and the sweep signal generator.

Z4 BB OSCILLATOR is the BB signal generator using a highly stable crystal oscillator.

Z5 CRYSTAL OSC AND BB SWEEPER consists of a stable crystal oscillator of 70 MHz or 140 MHz and a circuit which generates the BB sweep signals.

Z8 MOTHER BOARD is the circuit for connecting the various PC boards.

Z9 LED BOARD is the circuit for displaying various parameters.

Z10 FRONT BOARD consists of the output circuit for BB signals and a circuit for generating the sweep signals of the BB SWEEPER.

Z11 POWER SUPPLY is +12 V, -12 V, +5 V and -5 V dc power supplies.

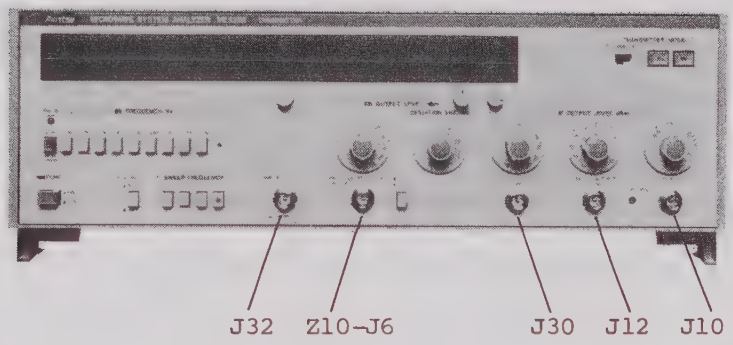


Fig. 5-1 Front View of Transmitter

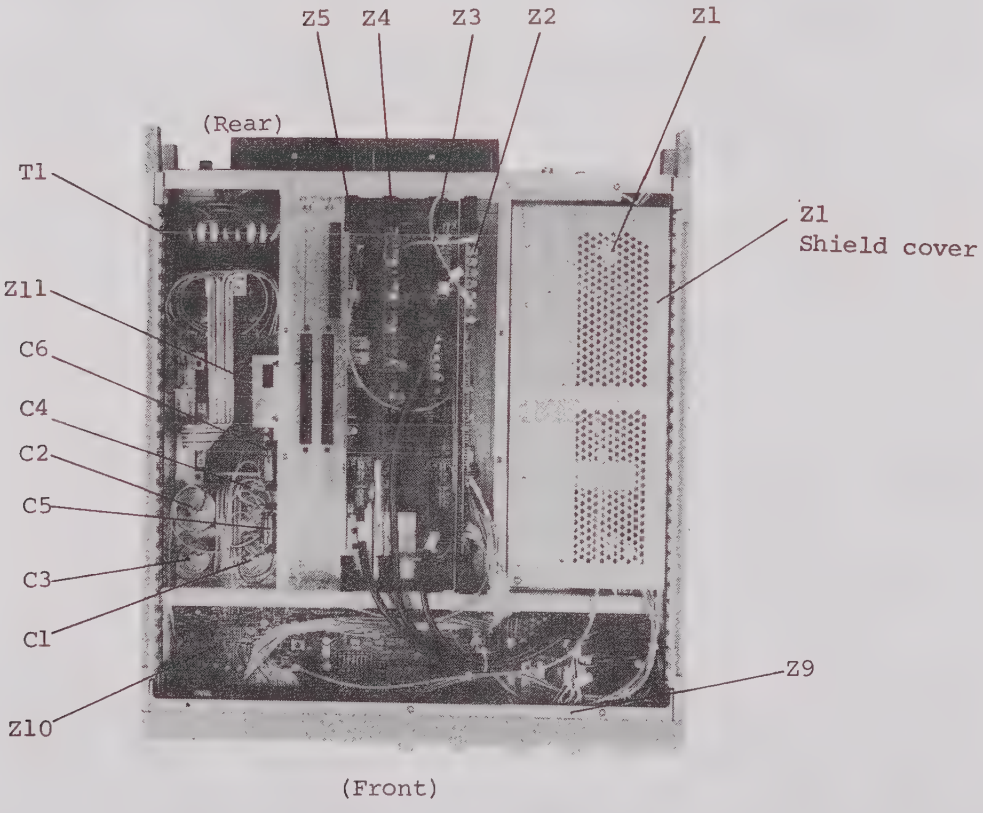


Fig. 5-2 Top View of Transmitter

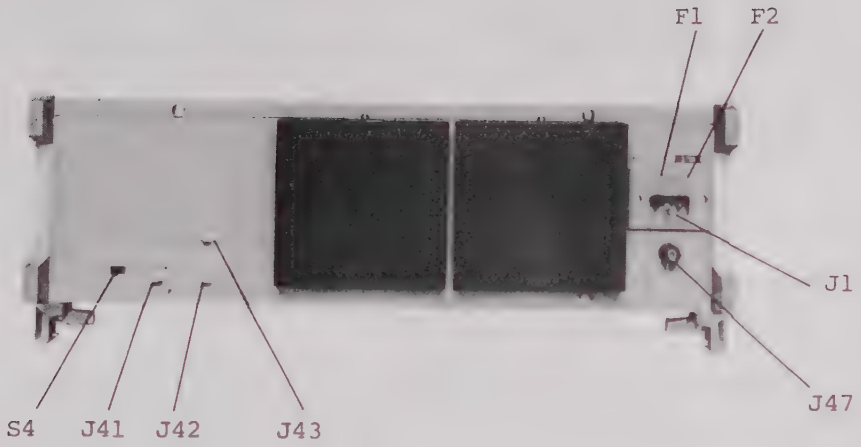


Fig. 5-3 Rear View of Transmitter

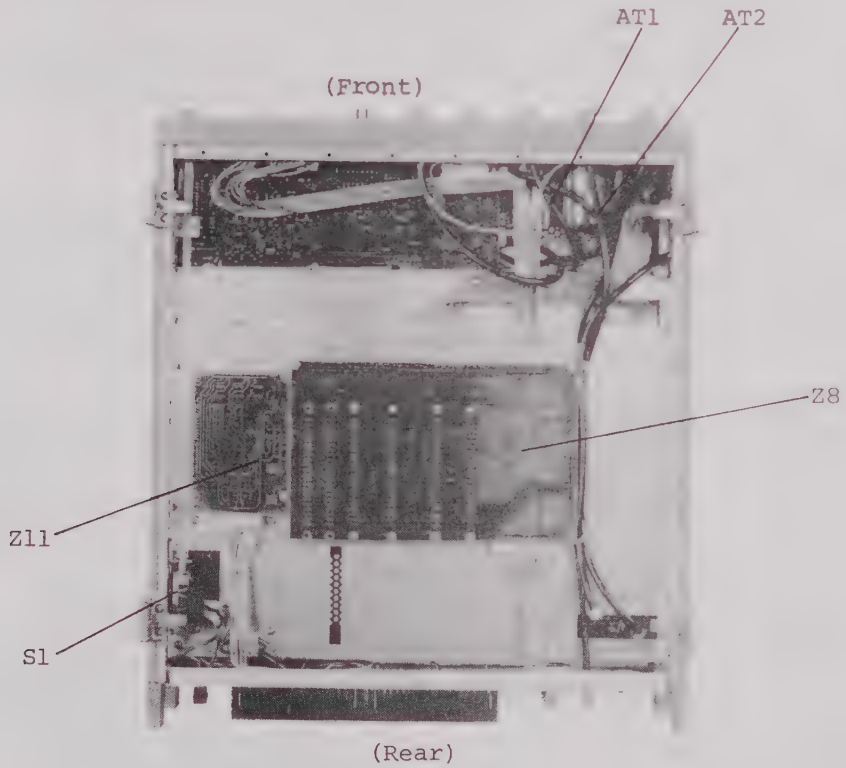


Fig. 5-4 Bottom View of Transmitter

5.2.2 Troubleshooting the Transmitter

Locate points in trouble in the following manner and check the circuit of each PC board.

(1) **No POWER ON**

Check the fuse.

Check the circuits on Z11 (see 5.2.11)

(2) **No IF OUTPUT signal**

case 1 → **AUX IF OUTPUT -10 dBm is normal**

Check the cable between IF OUTPUT LEVEL attenuator and Z1 (see 5.2.3).

case 2 → **IF OUTPUT signal and AUX IF OUTPUT signal level are abnormal**

Check the circuit on Z1 (see 5.2.3)

(3) **IF OUTPUT frequency is abnormal**

case 1 → **Sweep width is normal, but center frequency is abnormal**

Check the circuit on Z9 (see 5.2.9) and Z10 (see 5.2.10)

case 2 → **Center frequency is normal, but sweep width is abnormal**

Check the circuit on Z3 SWEEP OSCILLATOR (see 5.2.5).

case 3 → **Center frequency and sweep width are abnormal**

Check the circuits on Z2 Counter (see 5.2.4), Z10 Front board (see 5.2.10), Z1 (see 5.2.3) Oscillator and amplifier and these interface cables.

(4) **No CRYSTAL OUTPUT signal**

Check the circuit on Z5 crystal oscillator and BB sweeper (see 5.2.7).

(5) **No BB OUTPUT signal or abnormal**

Check the circuits on Z10 Front board (see 5.2.10), Z3 Sweep oscillator (see 5.2.5), Z4 BB oscillator (see 5.2.6) and these interface cables.

(6) **No Sweep signal in BB+SWEEP OUTPUT and SWEEP OUTPUT terminals**

Check the circuit on Z3 (see 5.2.5) Sweep oscillator.

(7) **No BB SWEEPER OUTPUT signal or abnormal**

Check the circuits on Z5 Crystal oscillator and BB sweeper (see 5.2.7) and Z10 Front board (see 5.2.10).

(8) **FM DEVIATION control is abnormal**

case 1 → **BB OUTPUT signal is normal, but Deviation is abnormal**

Check the circuits on Z10 Front board (see 5.2.10) and Z1 IF Oscillator and amplifier (see 5.2.3).

case 2 → **BB OUTPUT signal and Deviation are abnormal**

Check the circuit on Z10 Front board (see 5.2.10), Z3 Sweep oscillator (see 5.2.5), Z4 BB oscillator (see 5.2.6) and these interface cables.

(9) **No LED display**

Check the circuits on Z9 LED (see 5.2.9) and Z2 Counter (see 5.2.4).

(10) **IF SLOPE ADJ function doesnot operate**

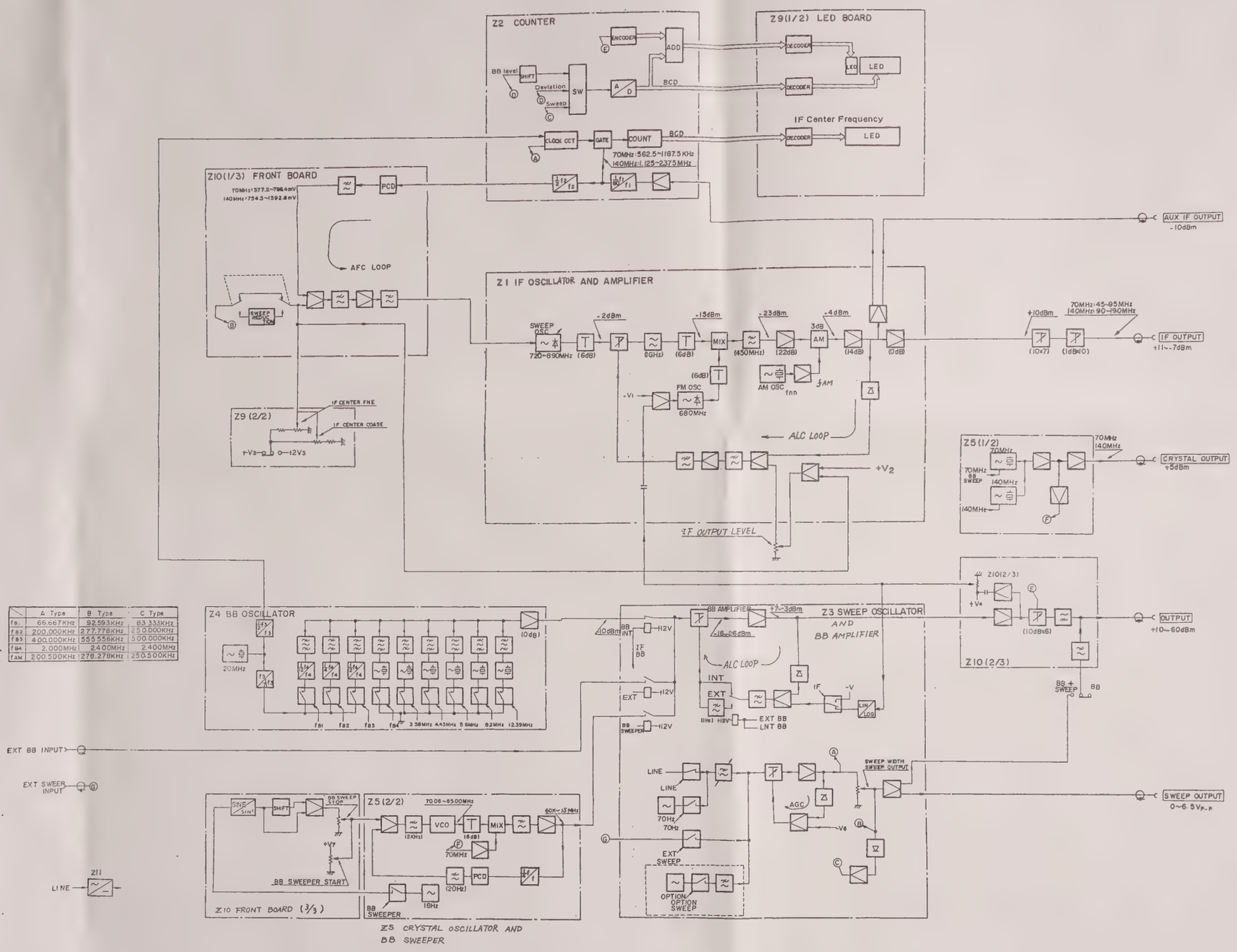
Check the circuits on Z10 Front board (see 5.2.10) and Z1 Oscillator and amplifier (see 5.2.3) and interface cables between these PC board.

(11) **AM-PM ADJ control does not function**

Check the circuit on Z1 IF Oscillator and amplifier (see 5.2.3).

(12) SWEEP REDUCTION function does not operate

Check the circuit on Z10 Front board (see 5.2.10)



	A Type	B Type	C Type
fb1	66.667KHz	92.593KHz	83.333KHz
fb2	200.000KHz	277.778KHz	250.000KHz
fb3	400.000KHz	555.556KHz	500.000KHz
fb4	2.000MHz	2.400MHz	2.400MHz
fAM	200.500KHz	278.276KHz	250.500KHz

Fig. 5-5 BLOCK DIAGRAM OF TRANSMITTER

NOTE 1

AC * * V	CONECTION	
100~108V	1 to 5	ⓐ to (2 to 6)
108~117V	1 to 5	ⓐ to (3 to 7)
117~127V	1 to 5	ⓐ to (4 to 8)
200~216V	2 to 5	ⓐ to 6
216~234V	3 to 5	ⓐ to 7
234~254V	4 to 5	ⓐ to 8

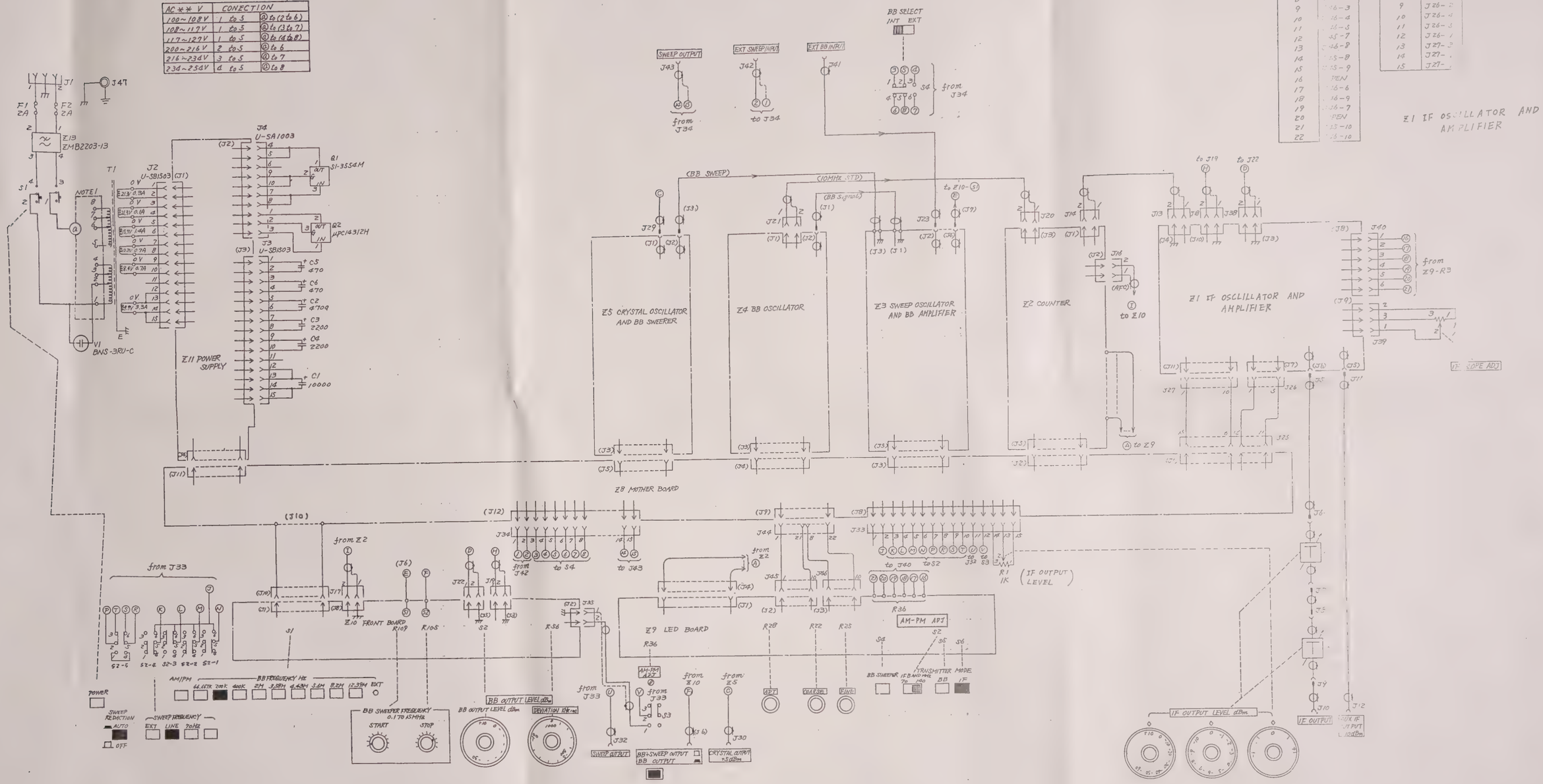
Connection between J44 and J45, J46

J44	J45, J46
1	J45-1
2	J45-2
3	J45-3
4	J45-4
5	J45-5
6	J45-6
7	J46-1
8	J46-2
9	J46-3
10	J46-4
11	J46-5
12	J45-7
13	J46-8
14	J45-8
15	J45-9
16	TERM
17	J46-6
18	J46-9
19	J46-7
20	TERM
21	J45-10
22	J46-10

Connection between J25 and J26, J27

J25	J26, J27
1	J27-6
2	J27-4
3	J27-7
4	J27-8
5	J27-9
6	J27-10
7	J27-12
8	J26-2
9	J26-3
10	J26-4
11	J26-5
12	J26-1
13	J27-3
14	J27-
15	J27-

Z1 IF OSCILLATOR AND AMPLIFIER



COMPONENT LIST: Table 6-1

Fig. 5-6 CIRCUIT DIAGRAM OF TRANSMITTER

(41W1303)

2. **IF OUTPUT Signal Frequency is abnormal**

Disconnect Z10-J1 from Z8-J10.

Ground C33.

case 1 — **IF AMPLIFIER is abnormal**

Check the level of ❻.

case 2 — **IF AFC LOOP is abnormal**

Check the 1/160 DIVIDER circuit on Z2 and the P.C.D. circuit on Z10.

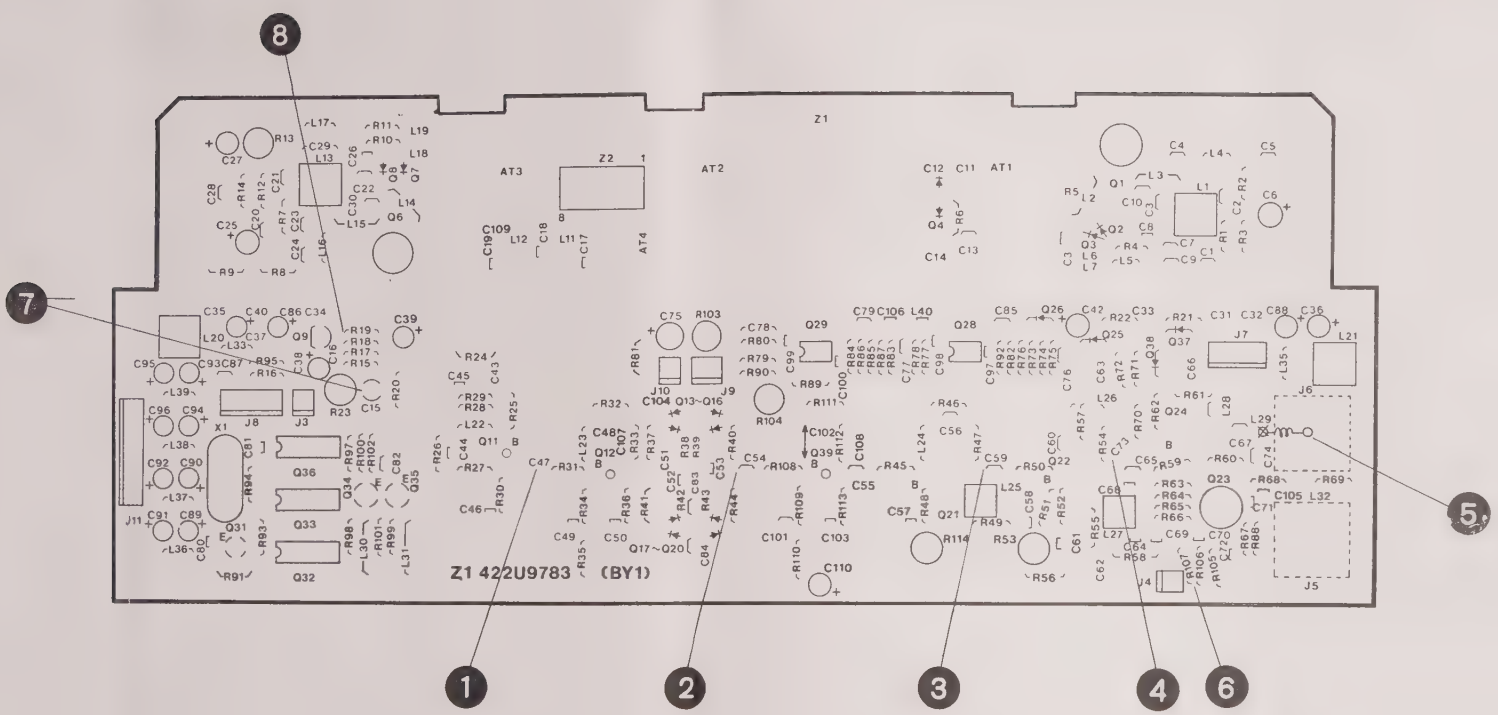
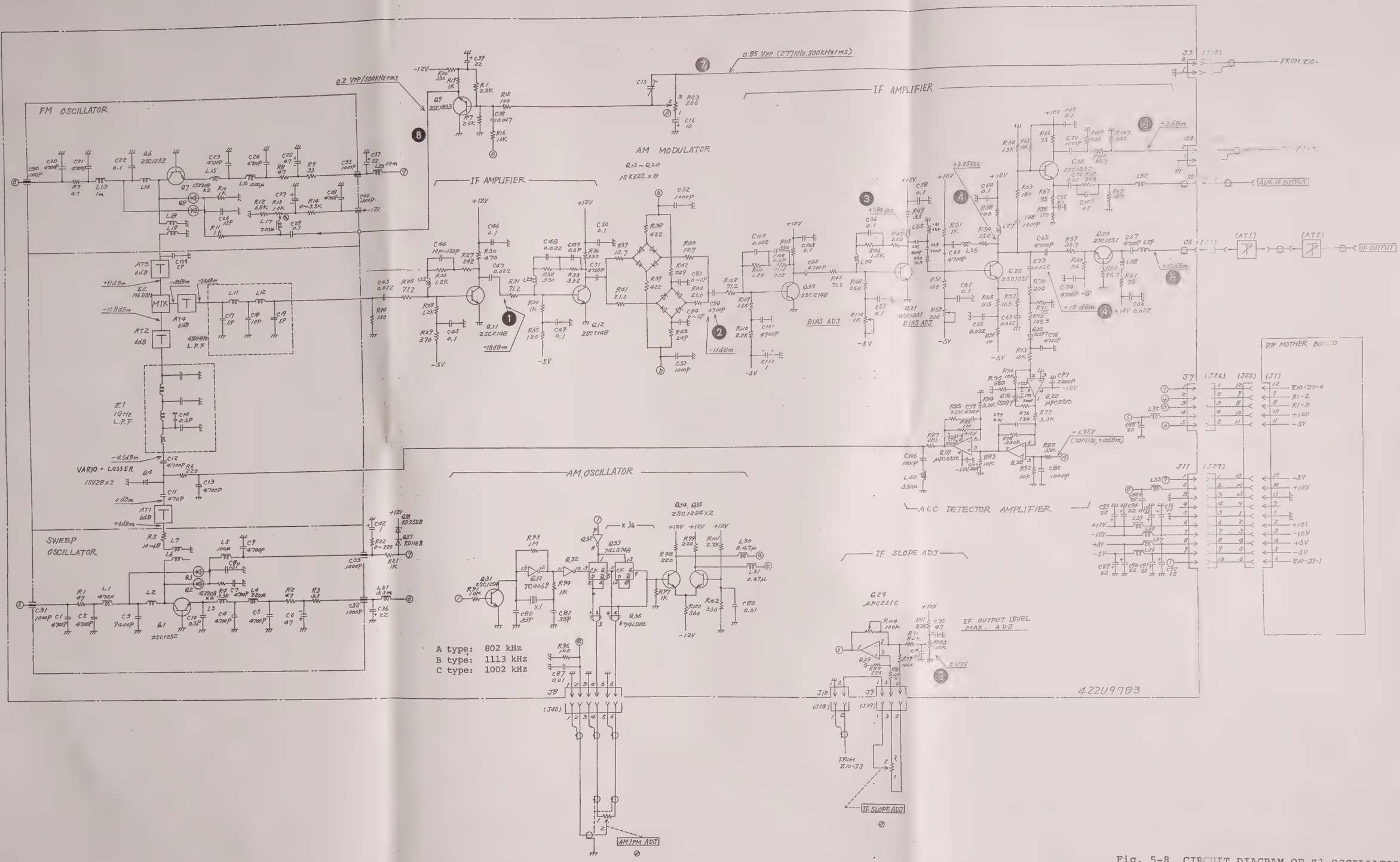


Fig. 5-7 Component Location of Z1



COMPONENT LIST: Table 6-2

Fig. 5-8 CIRCUIT DIAGRAM OF Z1 OSCILLATOR AND AMPLIFIER (TRANSMITTER)

(41W1295)

Table A BB Level of A/D converter

	BB PUTPUT LEVEL	Voltage at Q44-7 ❽
①	+10 dBm ∿ 0 dBm	+1.00 ∿ 0.00 V
②	0 dBm ∿ -10 dBm	0.00 ∿ -1.00 V
③	-10 dBm ∿ -20 dBm -20 dBm ∿ -30 dBm -30 dBm ∿ -40 dBm -40 dBm ∿ -50 dBm -50 dBm ∿ -60 dBm	-1.00 ∿ -1.99 V

SWEEP LEVEL is displayed by A/D converting (Q6) the signal ❼ for displaying the sweep level that is sent from Z3 and sending it to the Z9 LED board.

A/D converter constantly measures two functions on the timesharing basis, which is combined as shown in Table B.

Table B A/D converter

	Name	A/D input level
IF BAND	FM DEVIATION	0 ∿ 1 V/0 ∿ 1000 kHz rms
	SWEEP WIDTH	0 ∿ 0.5 V/0 ∿ ±50 MHz
BB BAND	BB OUTPUT LEVEL	See Table A
	SWEEP LEVEL	0 ∿ 0.65 V/0 ∿ 6.5 V

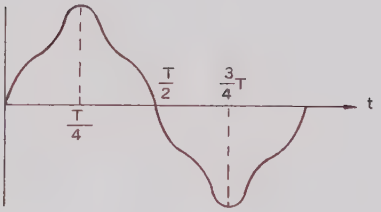


Fig. A Sweep Signal

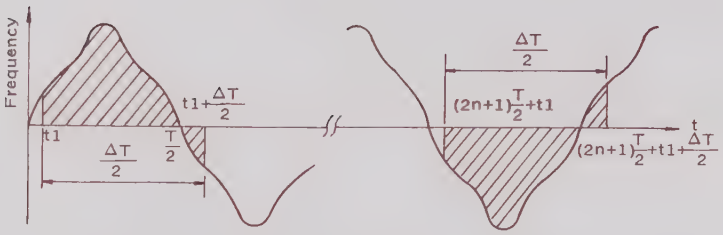


Fig. B Counter gate timing

FM DEVIATION is displayed by A/D converting (Q46) the dc voltage ❻ that is set with the FM DEVIATION dial (Z10) and sending it to the Z9 LED board.

IF SWEEP WIDTH is displayed by A/D converting (Q46) the signal ❼ for displaying the sweep width that is sent from Z3 and sending it to the Z9 LED board.

BB OUTPUT LEVEL is displayed by A/D converting (Q46) the dc voltage ❽ proportional to the continuous variable dial of 0 to -10 dB, adding it to the value of the 10 dB step attenuator, and sending it to the Z9 LED board. Relationship between BB OUTPUT LEVEL at the point of Q44-7 ❽ and dc voltage is shown in the table below.

If the sweep frequency is a symmetrical wave as shown in Fig. A and if the positive and negative half-waves form a symmetrical wave for T/4 and 3T/4, the sweep frequency $\omega(t)$ may be expressed by formula (1).

$$\omega(t) = \omega_0 + \Delta\omega_1 \sin pt + \Delta\omega_3 \sin 3pt + \ldots \quad (1)$$

In formula (1), ω_0 represents the center frequency and p represents the sweep frequency. If the gate time of the counter is ΔT in this case, the frequency is counted from time t_1 to time $t_1 + \Delta T/2$ at first. Then, the frequency from time $(2n + 1)T/2 + t_1$ to time $(2n + 1)T/2 + t_1 + \Delta T/2$ is counted (Fig. B). When the both counted values are added and displayed, the displayed frequency ω_1 may be expressed by formula (2).

$$\omega_1 = \frac{1}{\Delta T}\left\{\int_{t_1}^{t_1+\frac{\Delta T}{2}} \omega(t)\,dt + \int_{(2n-1)\frac{T}{2}+t_1}^{(2n-1)\frac{T}{2}+t_1+\frac{\Delta T}{2}} \omega(t)\,dt\right\} \quad \ldots\ (2)$$

By substituting formula (1) for formula (2) and placing $p = 2\pi/T$, $\omega_1 = \omega_0$ can be obtained. This means that the center frequency can be displayed accurately by aligning a certain time of the sweep signal and the time $(2n + 1)T/2$ time later with the gate time of the counter and by displaying the total of both. In practice, however, the sine wave is used as the sweep signal and the zero cross point of the sweep signal is used as the reference of the gate timing. That is, $\omega(t) = \omega_0 + \Delta\omega_1 \sin pt$ in formula (2) and the equipment is operated at $t_1 = 0$.

5.2.4 Z2 COUNTER

(1) Circuit description

This circuit consists of a circuit for counting the center frequency of the IF signal and a circuit for displaying BB level, sweep level, FM deviation, and sweep width.

IF SWEEP SIGNAL frequency is displayed with high accuracy using the following measuring methods: For the reasons given below, it is not easy to introduce the frequency counter for displaying the center frequency of the sweep frequency generator and, therefore, the frequency was set with a dial in the past:

1) Since the frequency varies during the gate time of the counter, the center frequency is not necessarily be counted. A long gate time is required for displaying the center frequency as the average value of all sweep frequency ranges, which poses a problem in response. It is almost impractical in the case of sweep by low frequency.

2) The center frequency as an average value may be displayed quickly when an integer multiple of the sweep repetition cycle and the gate time of the counter are accurately coincide with each other.

In such case, however, the sweep frequencies are limited. Therefore, this method is insignificant where the sweep frequency is to be set freely. This equipment has overcome the above mentioned problems by employing the below described methods which enables the center frequency to be displayed on the counter quickly and accurately.

(2) Repair

1. **IF OUTPUT Signal Frequency is abnormal**

Apply the 70 MHz single to J1.

case 1 → **1/160 DIVIDER is abnormal**

Check the waveforms of ❷ to ❹.
(The period of ❷ is equal to that of ❹.)

Check the output frequency of J2.

case 2 → **IF AFC Loop is abnormal**

Check the P.C.D. circuit on Z10.

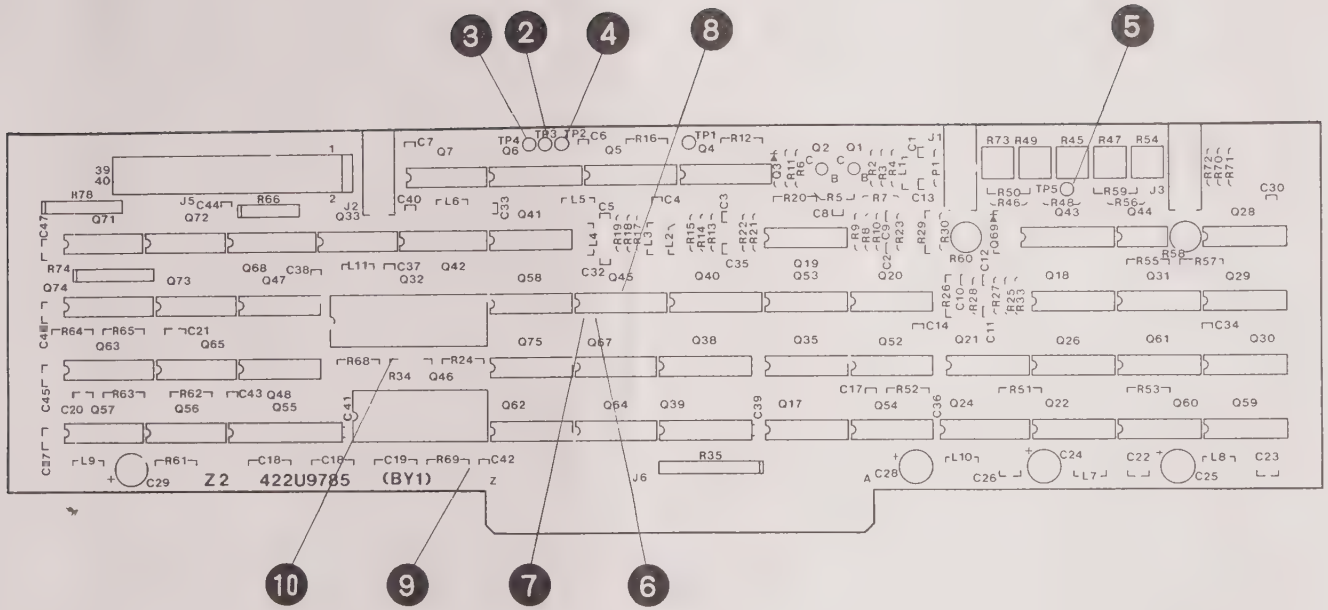


Fig. 5-9 Component Location Z2

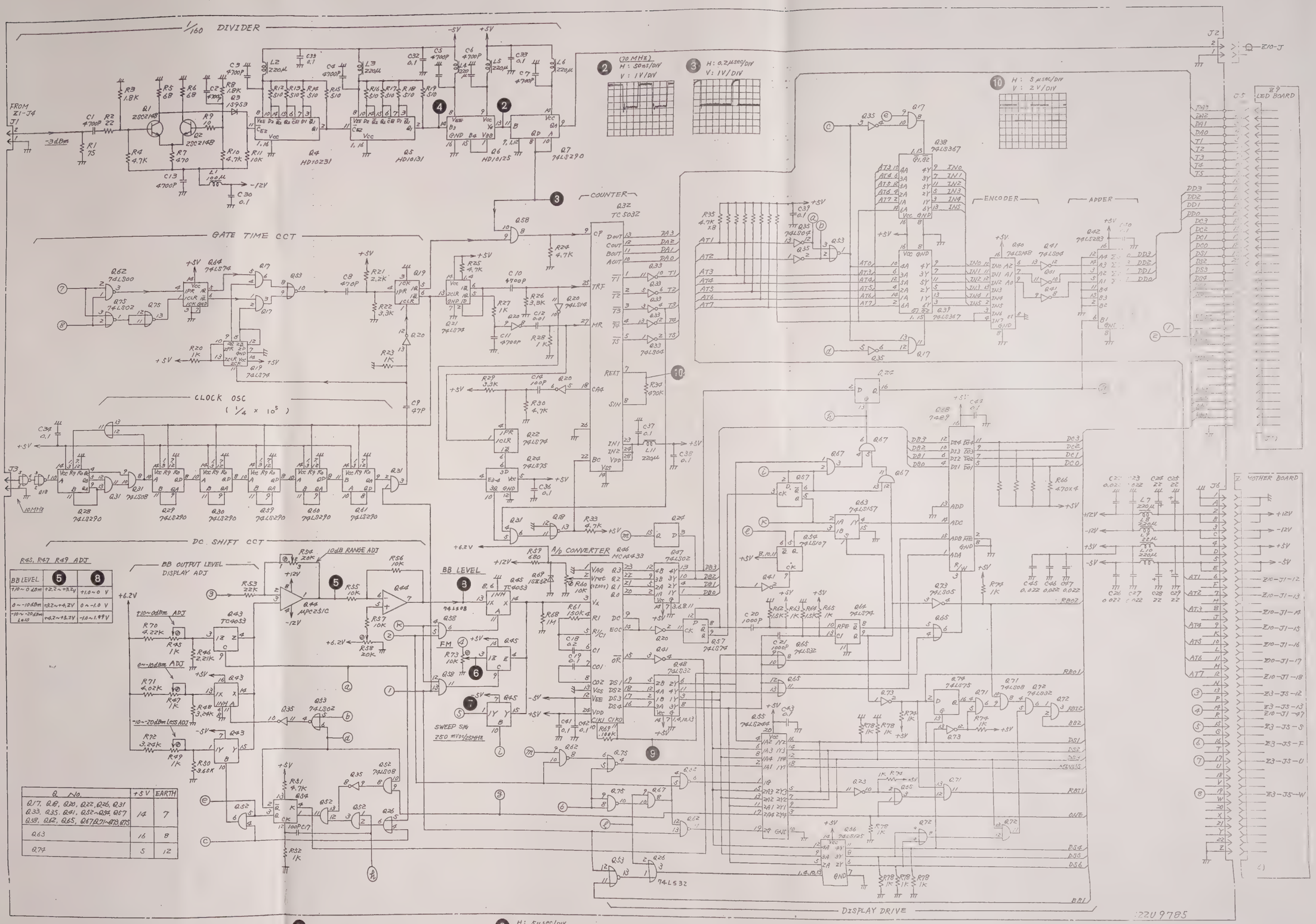


Fig. 5-10 CIRCUIT DIAGRAM OF Z2 COUNTER (TRANSMITTER)

(41W1281)

5-25/5-26

COMPONENT LIST: Table 6-3

5.2.5 Z3 SWEEP OSCILLATOR AND BB AMPLIFIER

(1) Circuit description

This circuit consists of the ALC circuit for stabilizing the level of the BB signal and a circuit for generating the SWEEP signals.

BB ALC circuit consists of the variable attenuator (Q1), BB AMPLIFIERS (Q2 to Q3 and Q7 to Q8), dc feedback type detector (Q11), and dc signal comparator (Q11).

BB OUTPUT LEVEL is controlled through the LOGARITHM AMPLIFIERS (Q12 to Q14) using the dc voltage ❽ set by the BB OUTPUT LEVEL dial as the reference voltage of the ALC circuit.

SWEEP CIRCUIT consists of the SWEEP OSCILLATOR, BAND PASS FILTER (Q29), SWEEP AGC circuit (Q39 through Q41, Q59), and SWEEP OUTPUT AMP (Q47 through Q53).

SWEEP LEVEL DETECTOR (Q54) is used to detect the SWEEP signal set with the SWEEP OUTPUT/SWEEP WIDTH dial, send it to Z2 COUNTER, and display SWEEP OUTPUT and SWEEP WIDTH.

COUNTER TIMING CIRCUIT (Q39, Q46) is the circuit for generating the trigger pulse from the SWEEP signal when counting the IF center frequency, which consists of a circuit (Q39) for converting the waveform of the SWEEP signal to a square wave and a frequency divider (Q46).

(2) Repair

1. No Sweep signal at BB+SWEEP OUTPUT and SWEEP OUTPUT terminals

Apply the 40 Hz, 2 Vp-p signal to EXT SWEEP INPUT (rear panel).

case 1 → EXT SWEEP is normal

Check the frequencies and levels at R70 and ❷ .

case 2 → SWEEP AGC and SWEEP OUTPUT AMP are abnormal

Check the levels at ❺ , R150, and R134.

2. No BB OUTPUT signal or abnormal

Apply the 200 kHz, -10 dBm signal to J1.

case 1 → Normal, when setting TRANSMITTER MODE to IF

Check the voltages of ❶ and ❽ .

case 2 → BB AGC is abnormal

Jumper R6.

Check the levels and voltages at C7, C8, C15, and R33.

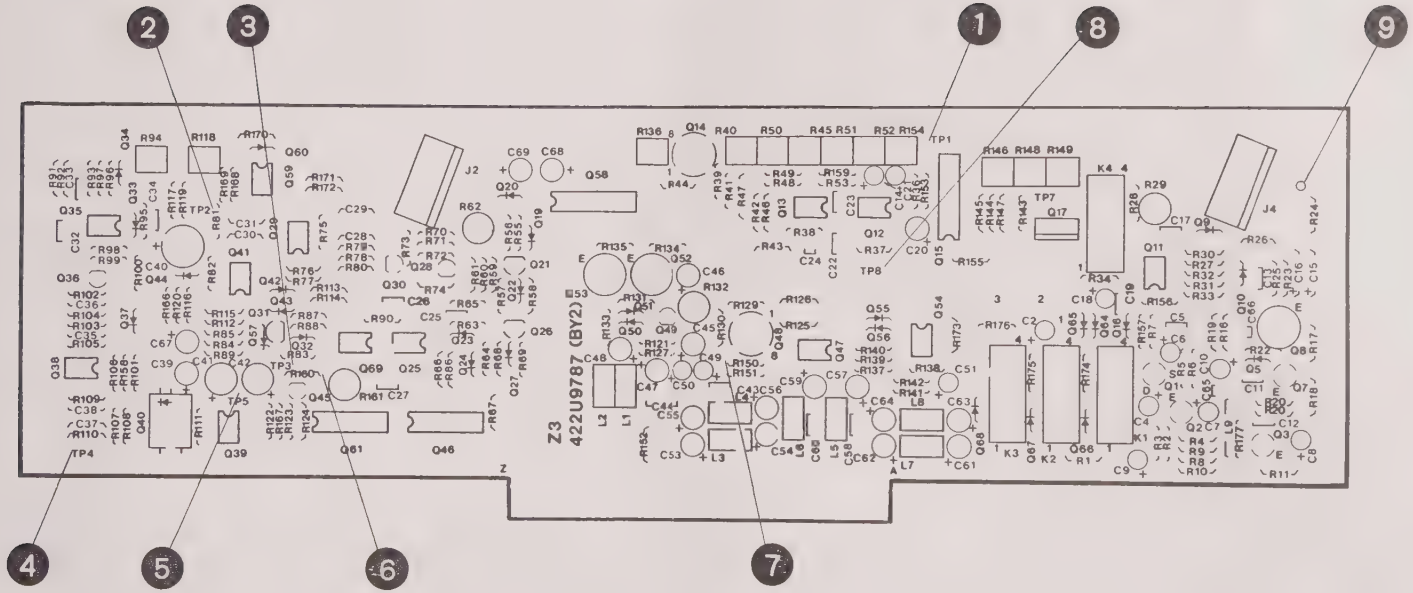
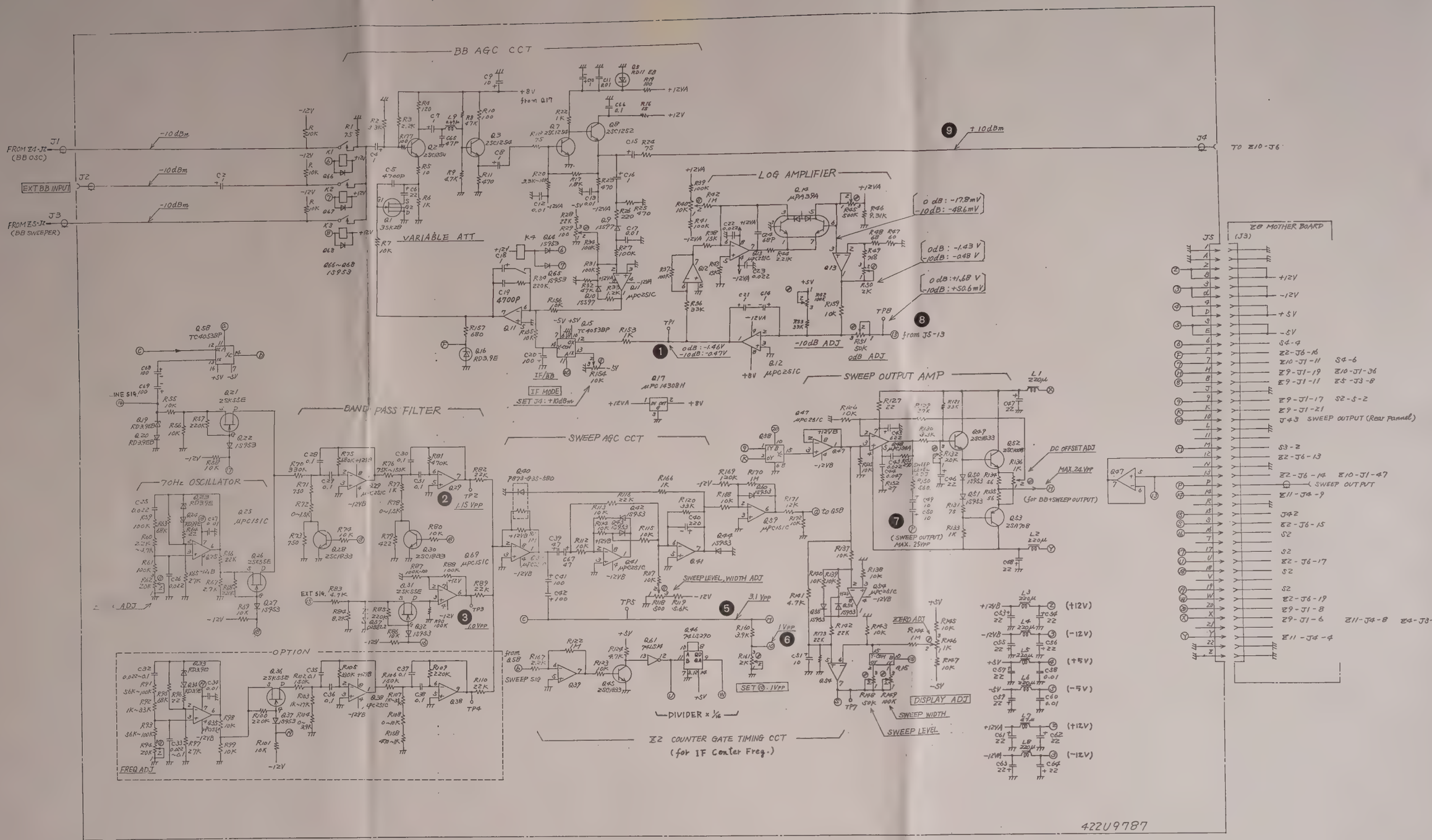


Fig. 5-11 Component Location of Z3



COMPONENT LIST: Table 6-4

Fig. 5-12 CIRCUIT DIAGRAM OF Z3 SWEEP OSCILLATOR AND BB AMPLIFIER (TRANSMITTER)

(41W1296)

(2) Repair

1. **No BB OUTPUT signal or abnormal**

case 1 → **BB High FREQ is normal**

Check the frequency and level of J1.

Select one of the three frequencies of BB Low FREQ, and check the frequencies and levels at R83, R108, and R105. (❶❷❸)

case 2 → **BB OUTPUT signal is abnormal**

Check the frequencies and levels at C78 to C84. (❹ ∿ ❾)

Check the frequency and level of J2.

5.2.6 Z4 BB OSCILLATOR

(1) Circuit description

This circuit generates the BB signals.

BB LOW FREQ is generated by dividing the output signal of the 20 MHz crystal oscillator (X8, Q19) and removing the higher harmonic with a band pass filter. The dividing ratio is as shown below.

BB Low Frequency

Model	BB Frequency	Frequency at ⑫	Frequency divider
A type	66.667 kHz	800 kHz ($\times \frac{1}{25}$)	$\times \frac{1}{12}$
	200 kHz		$\times \frac{1}{4}$
	400 kHz		$\times \frac{1}{2}$
B type	92.593 kHz	1111.111 kHz ($\times \frac{1}{18}$)	$\times \frac{1}{12}$
	277.778 kHz		$\times \frac{1}{4}$
	555.556 kHz		$\times \frac{1}{2}$
C type	83.333 kHz	1000 kHz ($\times \frac{1}{20}$)	$\times \frac{1}{12}$
	250 kHz		$\times \frac{1}{4}$
	500 kHz		$\times \frac{1}{2}$

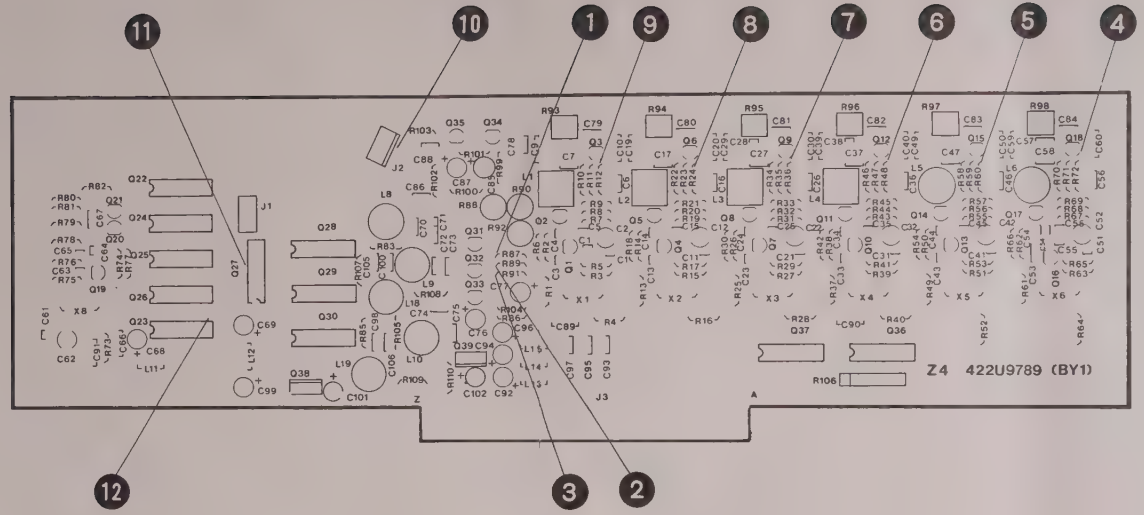
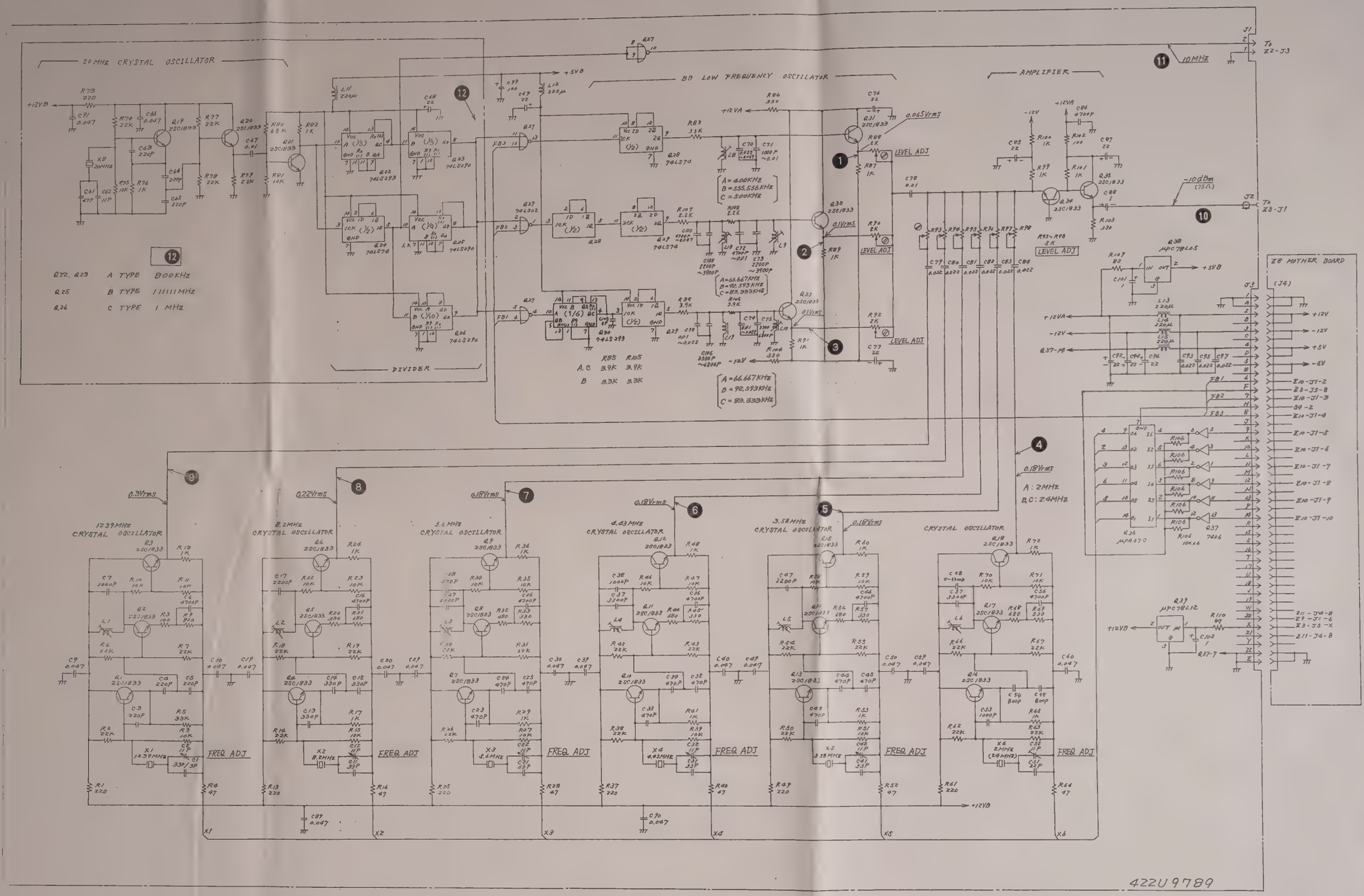


Fig. 5-13 Component Location of Z4



COMPONENT LIST: Table 6-5

Fig. 5-14 CIRCUIT DIAGRAM OF Z4 BB OSCILLATOR (TRANSMITTER)

(41W1282)

5.2.7 Z5 CRYSTAL OSCILLATOR AND BB SWEEPER

(1) Circuit description

This circuit consists of a 70 MHz or 140 MHz crystal oscillator and a BB sweeper.

BB SWEEPER consists of a 70 to 85 MHz VCO (Q16, Q17), mixer (Z1), BB amplifier (Q19, Q33), and PCD (Pulse Count Detector) (Q20 through Q31).

The VCO output is mixed with the 70 MHz crystal oscillator signal ❺ , converted to the BB frequency, and sent from J2 to Z3 ALC circuit via the BB amplifier.

18 Hz OSCILLATOR is the circuit for generating the sweep signal for the BB sweeper. The waveform of the oscillator output is shaped by B.P.F (Q35) and sent to Z10 front board.

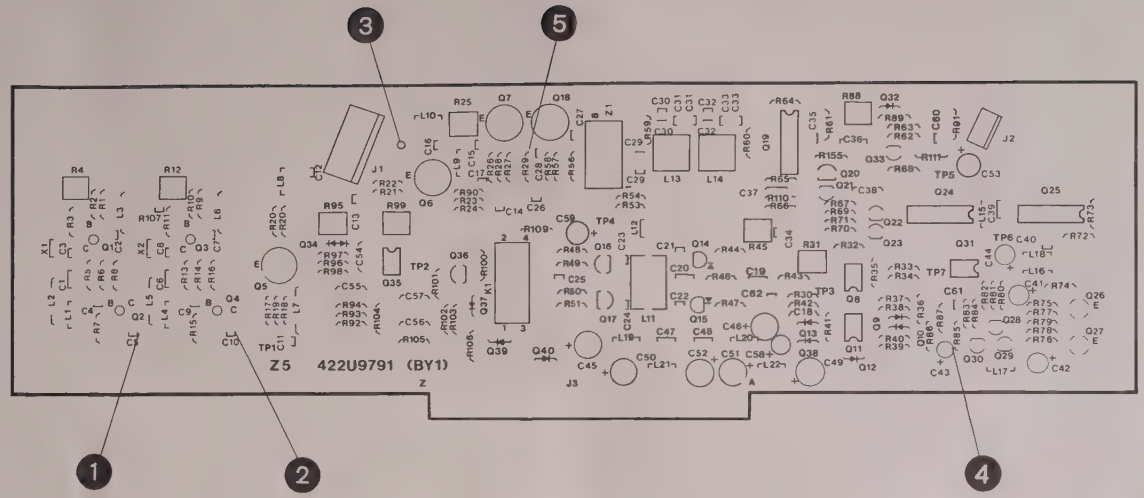


Fig. 5-15 Component Location of Z5

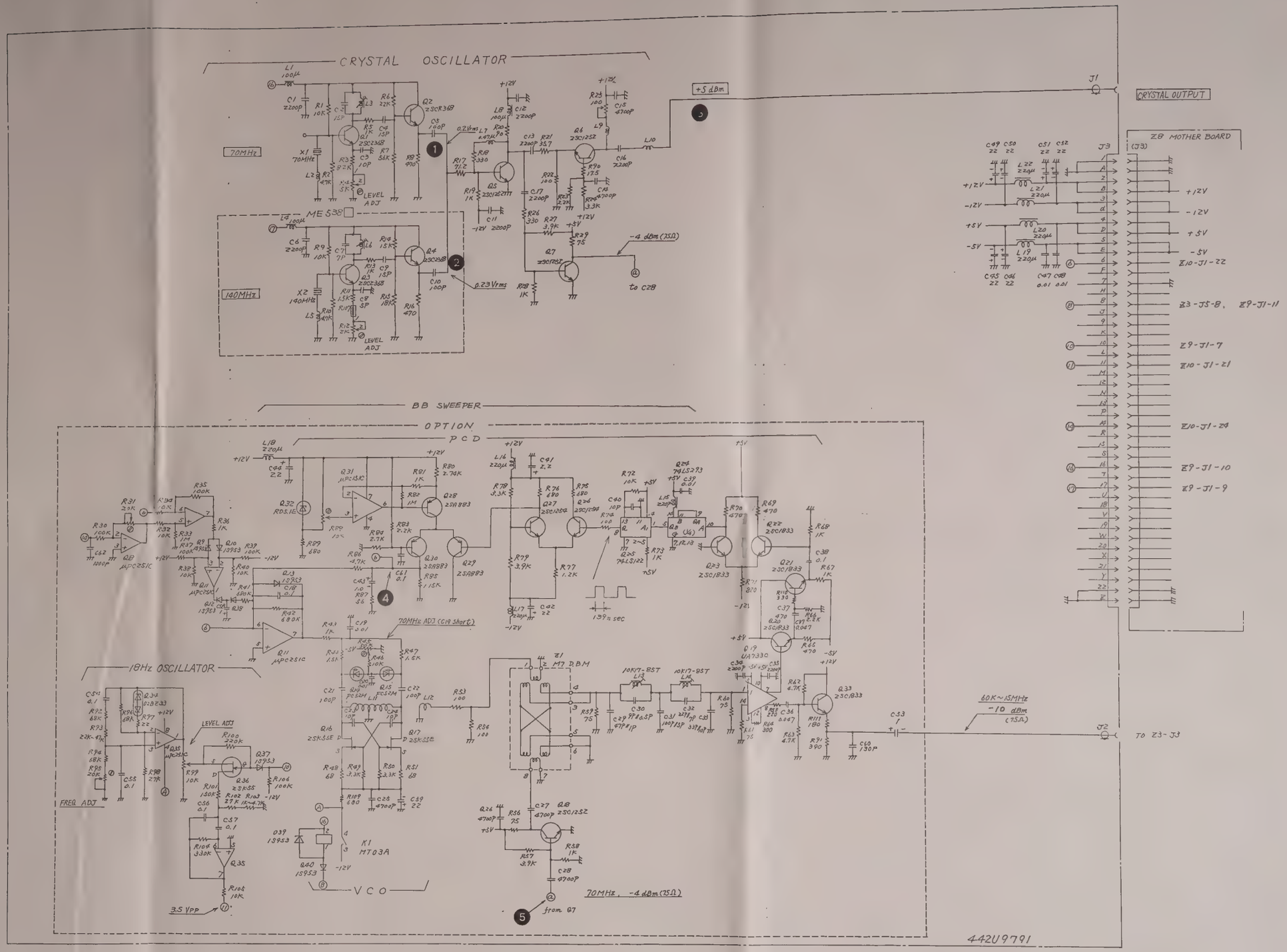


Fig. 5-16 CIRCUIT DIAGRAM OF Z5 CRYSTAL OSCILLATOR AND BB SWEEPER (TRANSMITTER)

(41W1297)

COMPONENT LIST: Table 6-6

5.2.8 Z8 MOTHER BOARD

(1) Circuit Description

This is the wiring circuit that connects the various PC boards.

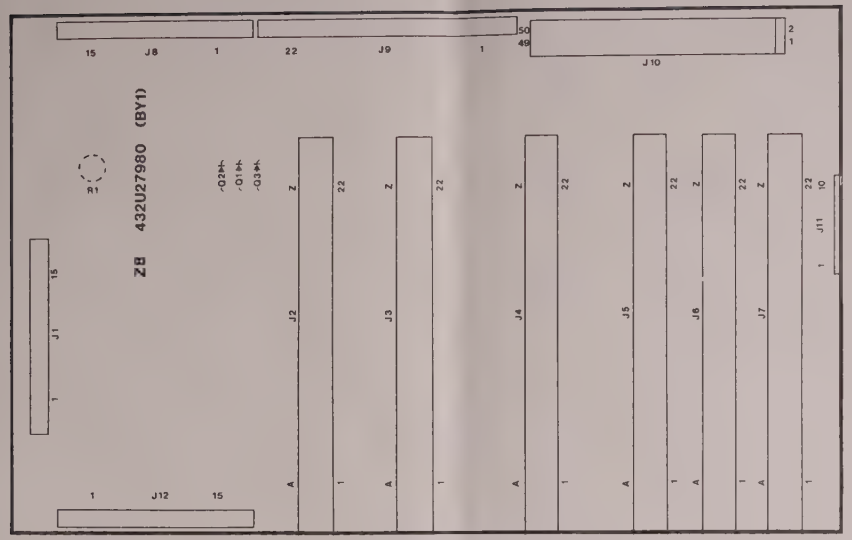


Fig. 5-17 Component Location of Z8

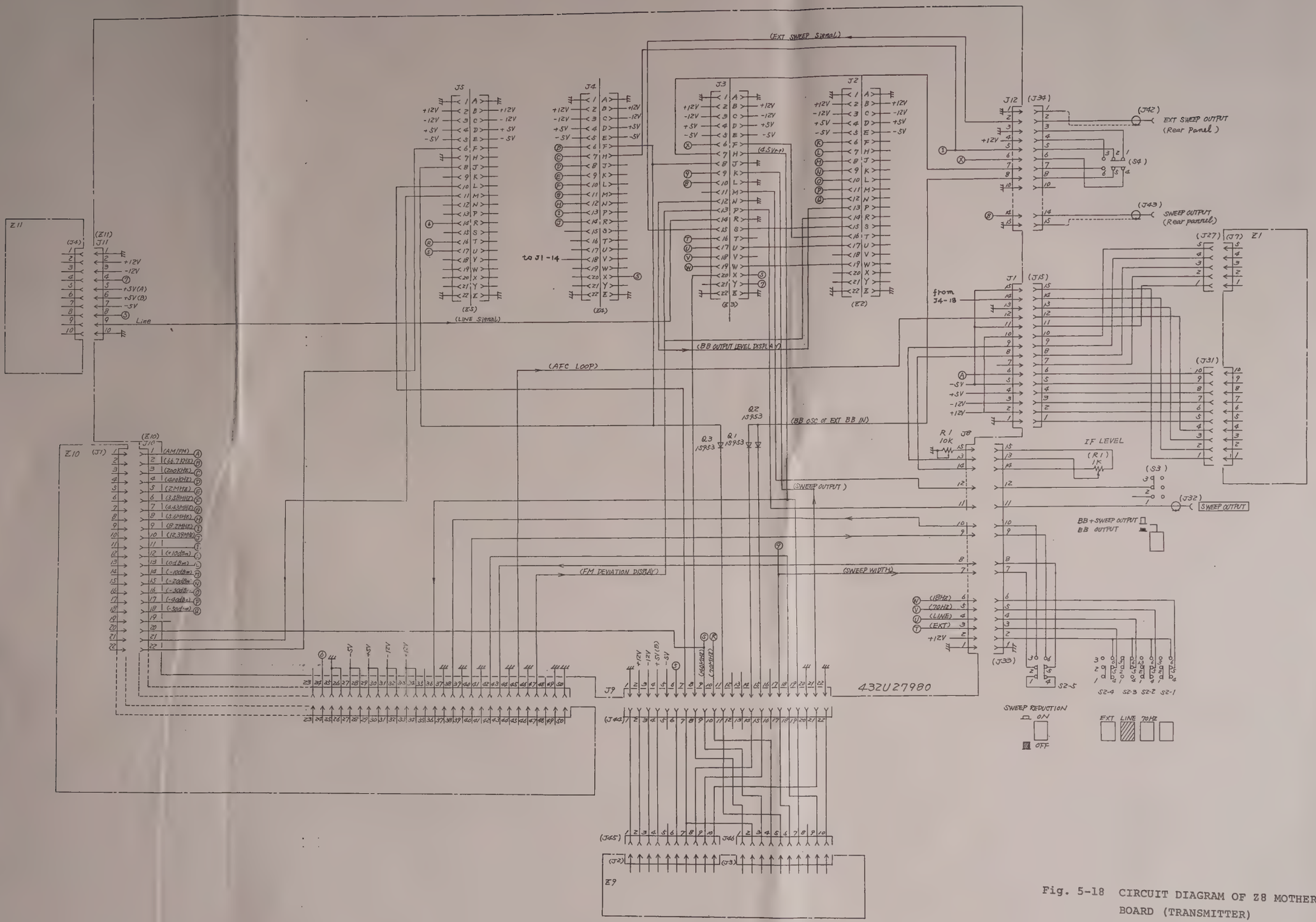


Fig. 5-18 CIRCUIT DIAGRAM OF Z8 MOTHER BOARD (TRANSMITTER)

(41W1302)

COMPONENT LIST: Table 6-7

5.2.9 Z9 LED BOARD

(1) Circuit description

This circuit consists of the function switching circuit, display circuit, and circuit for setting IF center frequency and IF sweep width.

FM DEVIATION/BB OUTPUT LEVEL, SWEEP WIDTH/SWEEP OUTPUT is displayed by converting the display data of the BCD to 7-segment data by the decoder (Q4), adding it to anode of the LED (Q10 through Q14), and driving (Q21) the cathode with the digits signals (⑲ through ㉔).

IF CENTER FREQUENCY is displayed by converting the display data of the BCD to 7-segment data by the decoder (Q6), adding it to the anode of the LED (Q15 through Q19), and driving the cathode (Q25) with digits signals (⑤ through ⑨).

FUNCTION is selected by the SWITCH (S4 through S6) circuit, its data is latched (Q89 to Q90), and lights the LED via the driver (Q91).

IF CENTER FREQ is set by the IF AFC circuit of Z10 front board by setting the voltage by the variable resistors R22 and R25.

SWEEP WIDTH/SWEEP OUTPUT is set by adjusting the amplitude of the sweep signal using R28.

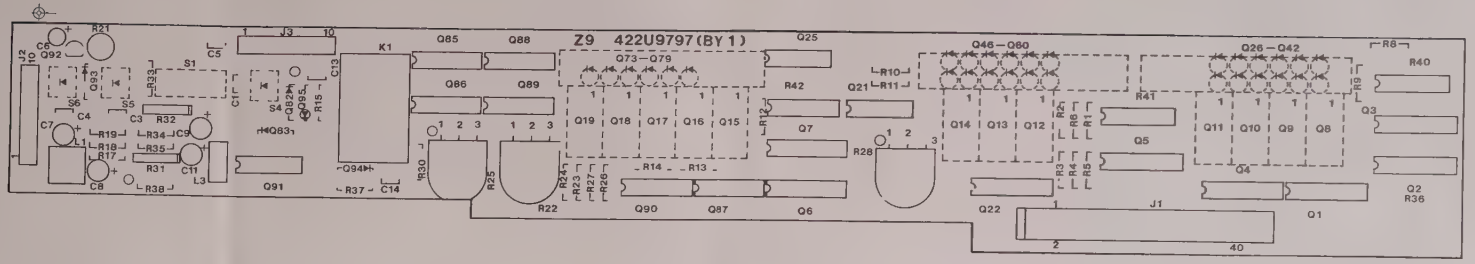


Fig. 5-19 Component Location of Z9

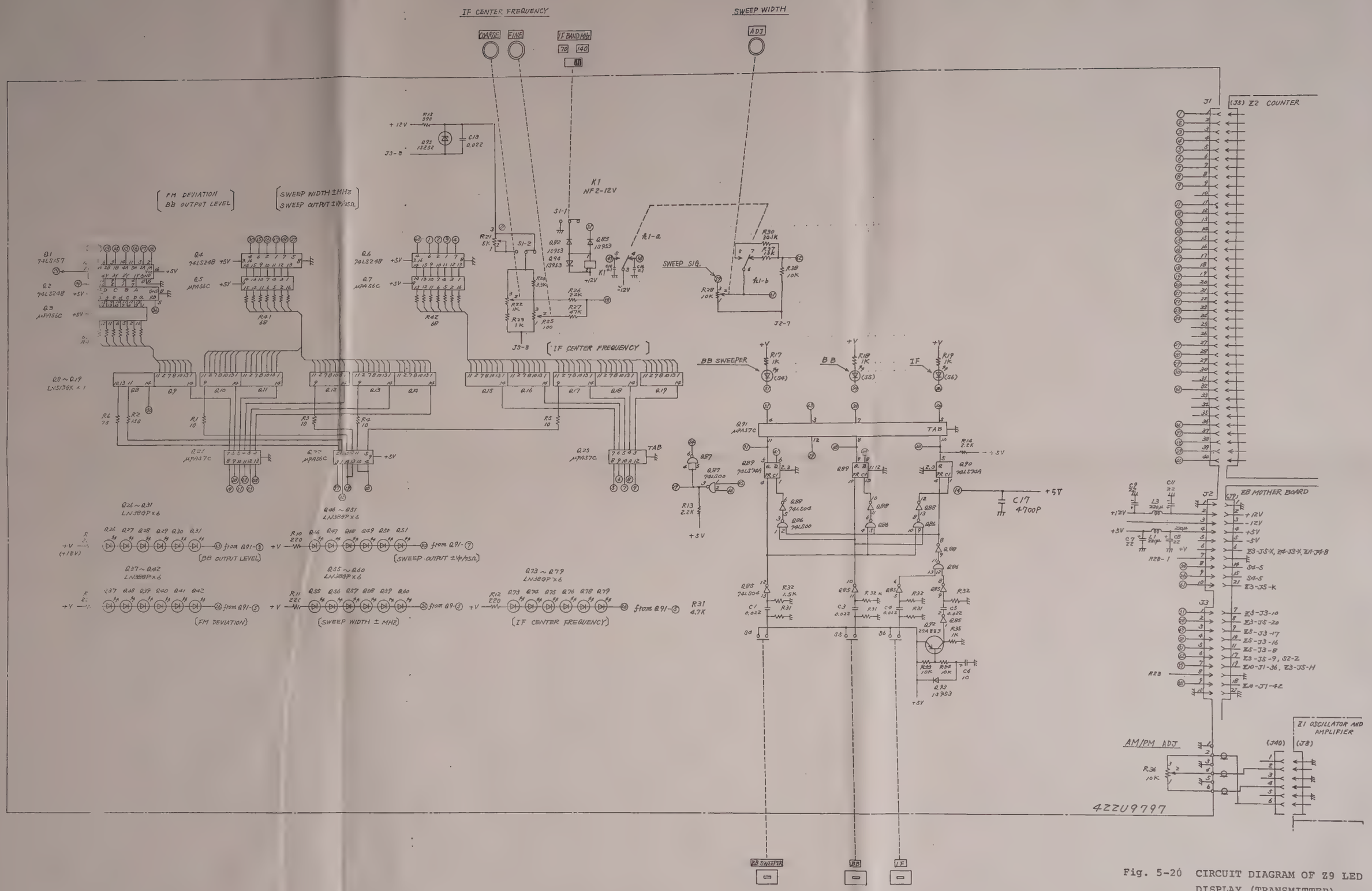


Fig. 5-20 CIRCUIT DIAGRAM OF Z9 LED DISPLAY (TRANSMITTER)

(41W1298)

COMPONENT LIST: Table 6-8

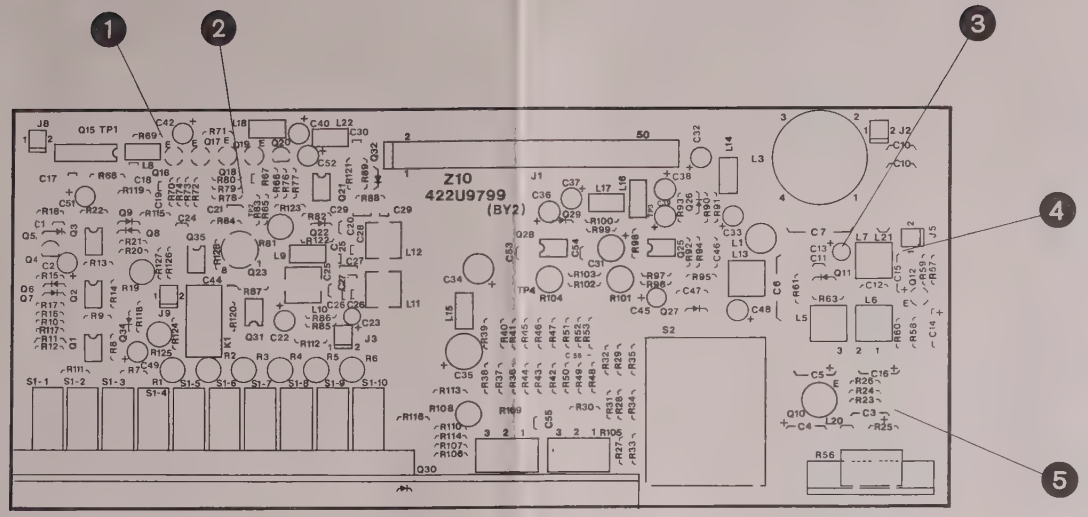


Fig. 5-21 Component Location of Z10

5.2.10 Z10 FRONT BOARD

(1) Circuit description

This circuit consists of the PCD circuit and DC AMPLIFIER of the IF AFC LOOP, BB output level control circuit, sweep reduction circuit, and BB sweeper frequency control circuit.

IF AFC LOOP consists of circuits for converting the frequency of the IF signal (J8) divided by Z2 COUNTER to the voltage by the PCD circuit (Q15 through Q21), for comparing it against the reference voltage by the comparator, and for returning it to the SWEEP OSC (Z1).

SWEEP REDUCTION is the circuit for reducing the IF sweep width by twice the BB frequency when it is "ON".

BB OUTPUT LEVEL is controlled to the 10 dB step by the attenuator (S2, R27 through R53) to continuously set 0 to 10 dB by the Variable Resistor (R56).

FM DEVIATION is set by the Variable Resistor (R56).

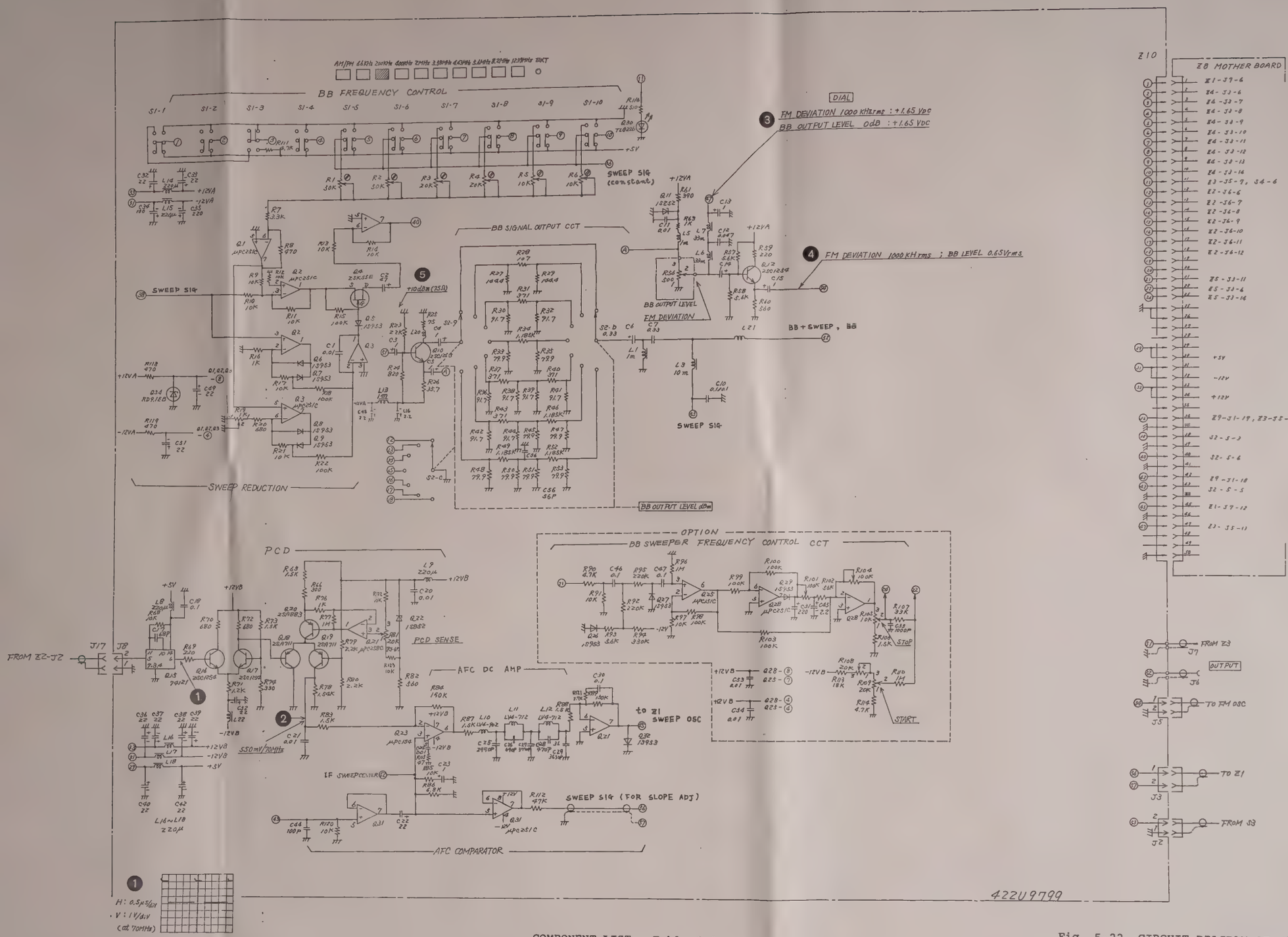
(2) Repair

1. **IF OUTPUT Frequency is abnormal**

   Apply the 437.5 kHz signal to J8.

   case 1 → **PCD is abnormal**

   Check the waveform of ❶ and the voltage of ❷.



COMPONENT LIST: Table 6-9

Fig. 5-22 CIRCUIT DIAGRAM OF Z10 FRONT BOARD (TRANSMITTER)

(41W1299)

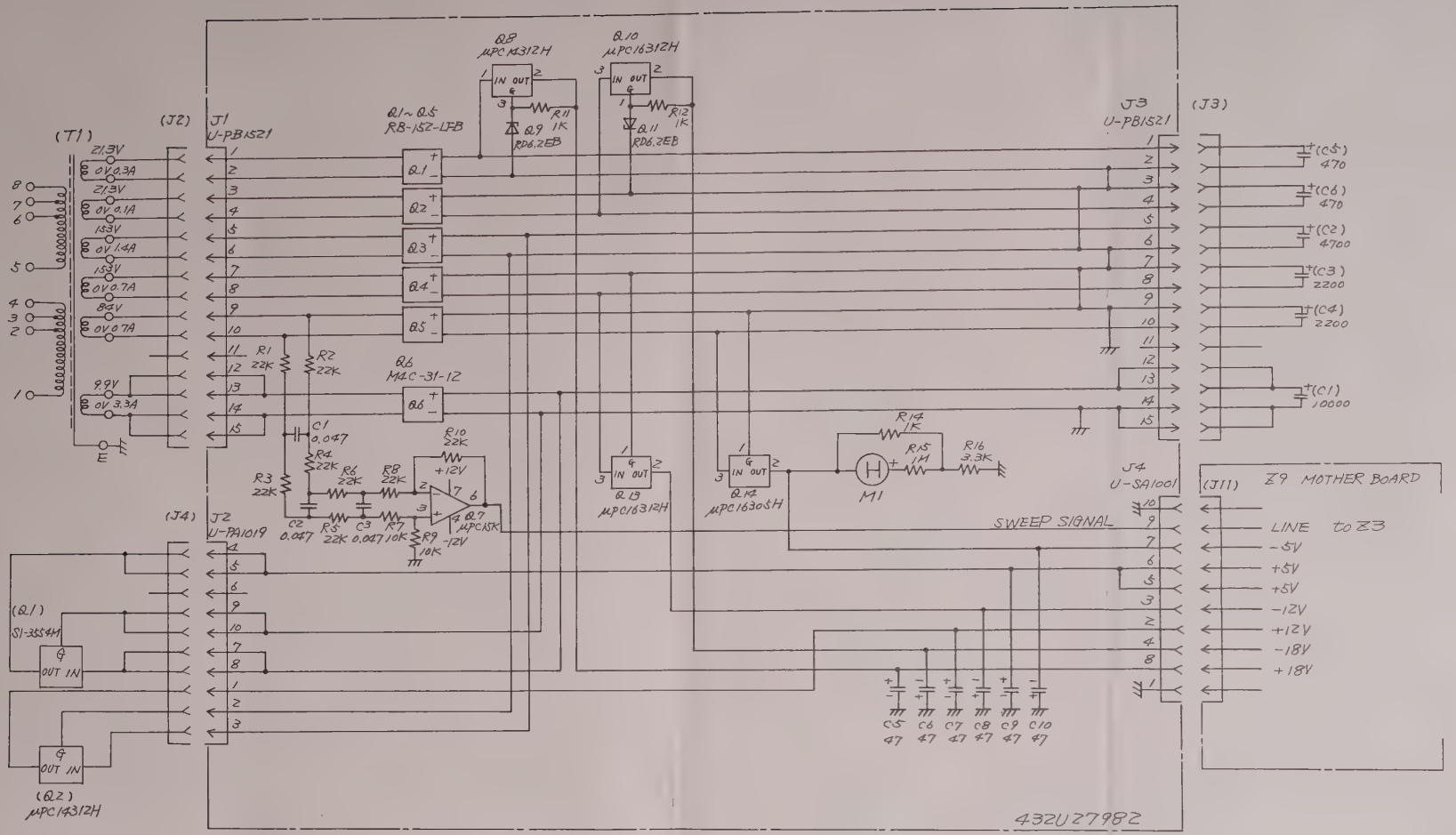


Fig. 5-24 CIRCUIT DIAGRAM OF Z11 POWER SUPPLY (TRANSMITTER)

(43W28520)

COMPONENT LIST: Table 6-10

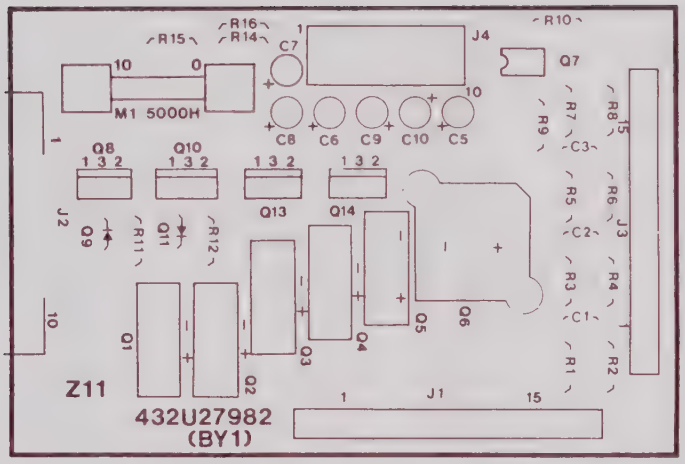


Fig. 5-23 Component Location of Z11

5.2.11 Z11 POWER SUPPLY

(1) Circuit description

This circuit consists of 6 dc stabilizing power circuits of ±5 V, ±12 V, and ±18 V.

5.3 RECEIVER

5.3.1 General

The receiver unit may be functionally divided into the IF receiver section, BB receiver section, control section, and CRT section.

IF receiver section consists of a demodulator for demodulating the BB signal from the IF input signal, frequency marker circuit, IF return loss circuit, and IF amplitude detection circuit.

The input circuit consists of the programable attenuator for setting the IF input level to the optimum operating point of the receiver.

BB receiver section consists of a circuit for detecting the amplitude of the BB signal and a circuit for detecting the phase. The input circuit consists of the programable attenuator for setting the BB input level to the optimum operating point of the receiver.

Control section has the functions of controlling the variable attenuator of the BB/IF input circuits and of automatically setting the vertical sense of the CRT.

CRT section consists of a high voltage generating circuit, vertical AMP, and horizontal AMP.

The block diagram is shown in Fig. 5-29. The circuit consists of 14 PC boards, Z1 through Z7 and Z9 through Z15, each of which has the following functions:

Z1 RANGING AND AVG consists of the function select circuit, ranging circuit, P-P detector circuit, and averaging circuit.

Z2 PHASE DETECTOR consists of the PLL circuit for detecting the phase of the BB signal, local oscillator, and circuit for detecting the receive frequency.

Z3 BB DETECTOR consists of the programable ATT, LINEARITY AND DG detector, BB level detector, and BB AMPL detector. The main function of this circuit is to detect the amplitude of the BB signal.

Z4 DISCRIMINATOR consists of a limiter, discriminator, DISC FOR AFC, and Horizontal SIGNAL circuit. The main function of this circuit is to demodulate the BB signal from the 17.78 MHz IF signal.

Z5 IF MIX AND RETURN LOSS consists of the programable ATT, local oscillator, IF AGC circuit, IF level detector, IF AMPL detector, and IF return loss detector.

The main function of this circuit is to convert the frequency of the IF input signal to 17.78 MHz IF signal.

Z6 MARKER AND SPECTRUM consists of the IF marker detecting circuit and a spectrum detecting circuit.

Z7 CPU BOARD is a digital processing circuit using the CPU and consists of the A/D converter and I/O circuit, etc.

Z9 MOTHER BOARD is the circuit for connecting the various PC boards.

Z10 OPERATING/LED BOARD consists of a keyboard for inputting various parameters and a display section for outputting the data.

Z11 DRIVER consists of a circuit for outputting the data from the Z7 CPU to the Z10 LED board and a circuit for counting the marker frequency.

Z12 X SELECT, X-Y RECORDER consists of a circuit for switching Y1, Y2 and marker signals on the time sharing basis, circuit for setting the phase of the Horizontal signal, and circuit for driving the X-Y recorder.

Z13 CRT DISPLAY consists of the high voltage generating circuit for driving the CRT, vertical AMP, and horizontal AMP.

Z14 POWER SUPPLY is the power supply circuit of the series regulator Z15 for converting ac to regulated dc.

Z15 AVG

This circuit is used to normalize the image to be measured in conjunction with the Z1 RANGING AND AVG circuit.

Z8 GPIB (Option) transmits and receives the information to and from GPIB interface bus (IEEE std 488-1978).

Z18 CONNECTOR BOARD consists of the GPIB connector and GPIB address switch.

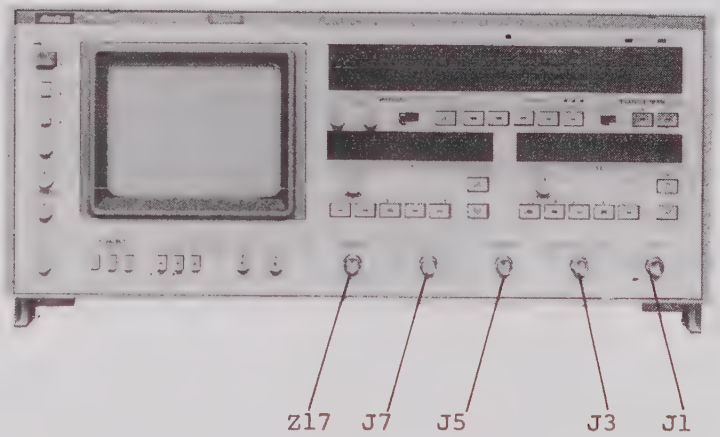


Fig. 5-25 Front View of Receiver

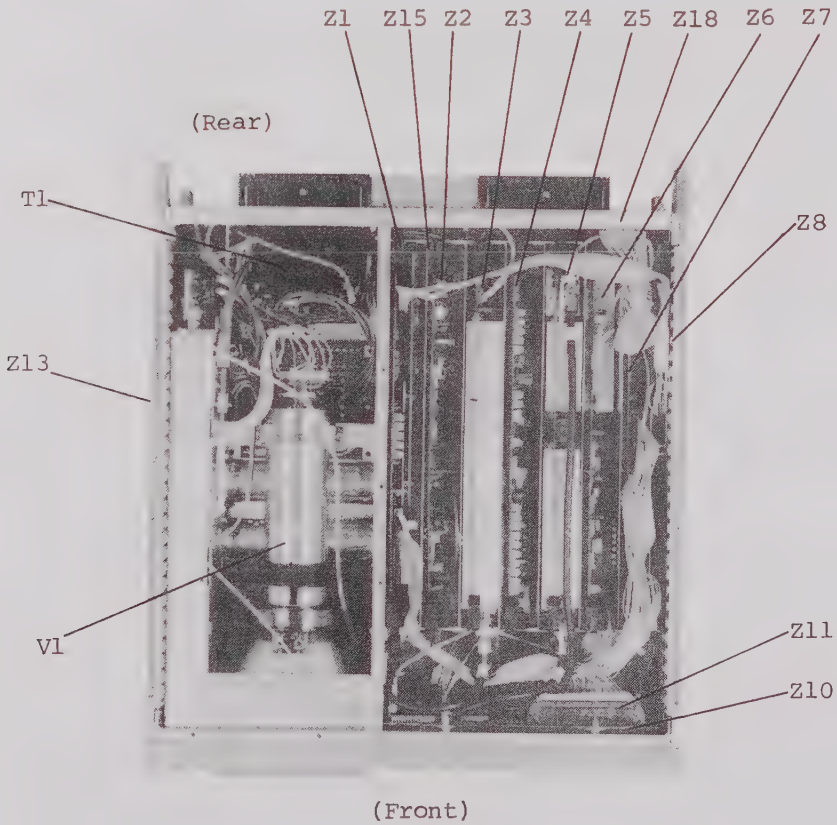


Fig. 5-26 Top View of Receiver

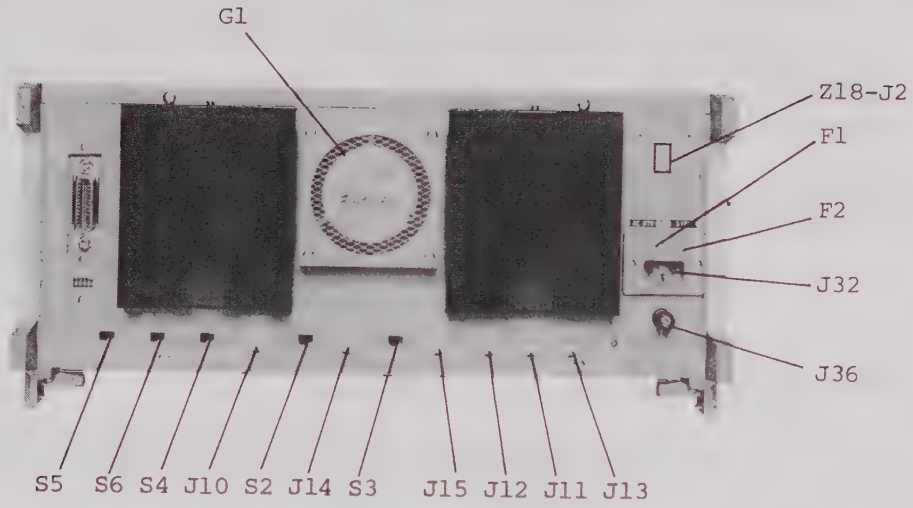


Fig. 5-27 Rear View of Receiver

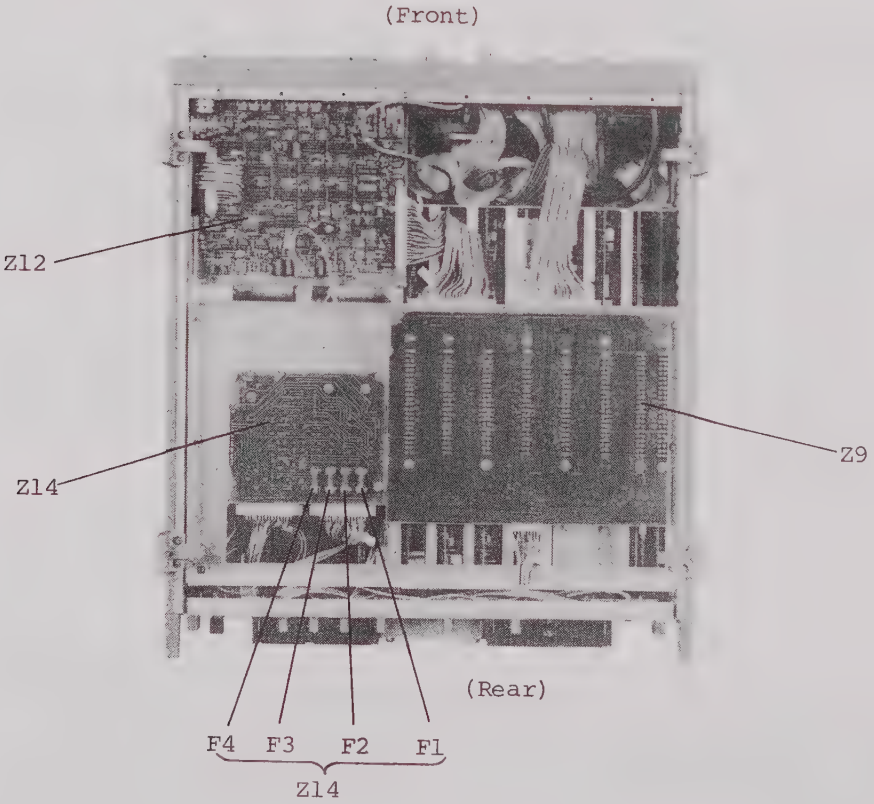


Fig. 5-28 Bottom View of Receiver

5.3.2 Troubleshooting the Receiver

(1) **NO POWER ON**

Check the fuse and Z4 POWER SUPPLY (see 5.3.15)

(2) **Troubles ⇨ Check the dc voltages of power source**

Check the dc voltages with reference to Z9 Mother board (see 5.3.10).

(3) **IF input level is not dispayed normaly**

case 1 → **IF input signal is not displayed properly**

Check the IF level (≧-20 dBm)

Check that the IF input frequency band is matched to Receiver Mode band.

Check that the IF input frequency sweep width is less than 70 ±25 MHz or 140 ±50 MHz.

case 2 → **AFC circuit does not operate**

Sympton: "-" (minus) of IF level LED goes on and off independently.

Check the disappearance of IF signal with reference to Z5 IF MIX and Return Loss (see 5.3.7) and Z4 discriminator (see 5.3.6).

Determine the abnormal point in the AFC loop with reference to Z5 (see 5.3.7) and Z4 (see 5.3.6).

Check the Z7 CPU board (see 5.3.9) and connection.

(4) FM deviation is not displayed normaly

case 1 → BB input level and IF input level are displayed normally.

Check the circuit on Z4 Discriminator (see 5.3.6) and Z7 CPU board (see 5.3.9).

case 2 → BB input level display is abnormal

Check the circuit on Z3 BB detector (see 5.3.5) and Z7 CPU board (see 5.3.9).

case 3 → AFC loop does not operate

Check the circuits with reference to case 2 of item (3).

case 4 → THRESHOLD EXTENSION (Rear panel) is ON?

Turn OFF the THRESHOLD EXTENSION, when the FM modulation frequency is over 556 kHz.

(5) BB Frequency Hz tunning LED does not light

case 1 → When using the Receiving Mode BB, LED is lighted.

Check the circuit on Z4 Discriminator (see 5.3.6).

case 2 → Both Receiving Modes IF and BB are abnormal

Check the circuits on Z3 BB detector (see 5.3.5) and Z7 CPU board (see 5.3.9).

case 3 → Input signal is abnormal.

Check the input signal.

(6) Slide Marker does not function

Check the circuits on Z6 Marker and Spectrum (see 5.3.8), Z3 BB detector (see 5.3.5) and Z12X select, X-Y recorder (see 5.3.13).

(7) **IF Amplitude can not be measured**

Check the circuits on Z5 IF MIX and Return loss (see 5.3.7), Z3 BB Detector, Z12 X select, X-Y recorder (see 5.3.13) and Z7 CPU board (see 5.3.9).

(8) **Linearity and DG can not be measured**

case 1 → **When using Receiving Mode BB, these can be measured**

Check the circuits on Z5 (see 5.3.7) and Z4 (see 5.3.6).

case 2 → **Both Receiving Mode IF and BB are abnormal**

Check the circuits on Z3 (see 5.3.5), Z12 (see 5.3.13), Z1 (see 5.3.3) and Z7 (see 5.3.9).

(9) **Delay and DP cannot be measured**

case 1 → **When using Receiver Mode BB, these can be measured.**

Check the circuits on Z5 (see 5.3.7) and Z4 (see 5.3.6).

case 2 → **Both Receiving Mode IF and BB are abnormal**

Check the circuits on Z3 (see 5.3.5), Z2 (see 5.3.4), Z12 (see 5.3.13), Z1 (see 5.3.3) and Z7 (see 5.3.9).

(10) **IF Return loss cannot be measured**

Check the circuits on Z5 (see 5.3.7), Z1 (see 5.3.3) and Z12 (see 5.3.13).

(11) **Spectrum cannot be measured**

Check the circuits on Z6 (see 5.3.7), Z4 (see 5.3.6), Z1 (see 5.3.3), Z12 (see 5.3.13) and Z7 (see 5.3.9).

(12) **AM-PM conversion cannot be measured**

Check the circuits on Z2 (see 5.3.4) and Z7 (see 5.3.9).

(13) NO images appear on the CRT

case 1 → IF level, BB level and P-P values are displayed normally

Check the circuits on Z13 (see 5.3.14) CRT Driver.

case 2 → No deflection takes place on the horizontal axis

Check the Horizontal signal generator on Z4 (see 5.3.6), analog switch on Z3 (see 5.3.5), X select switch on Z12 (see 5.3.13) and Horizontal AMP on Z12 (see 5.3.13).

case 3 → No deflection takes place on the Y axis, but the P-P values are normal.

Check the Y signal switch on Z12 (see 5.3.13) and Y axis AMP on Z13 (see 5.3.14).

(14) BLANKING, SCALE INTEN and INTENSITY do not function

Check the circuits on Z12 (see 5.3.13) and Z13 (see 5.3.14)

(15) NORMLZR function does not operate

Check the circuits on Z1 (see 5.3.3) and Z7 (see 5.3.9).

(16) P-P function does not operate

Check the P-P detector circuit on Z1 (see 5.3.3) and Z7 CPU (see 5.3.9).

(17) RANGE control function does not operate

case 1 — IF Return Loss image cannot be changed linearly by the manual range keys

Check the circuit on Z5 (see 5.3.7) and Z7 (see 5.3.9)

case 2 — Auto ranging function does not operate

Check the circuits on Z1 (see 5.3.3) and Z7 (see 5.3.9).

(18) Character or numerical LED does not light normaly

Check the circuits on Z10 (see 5.3.11) and Z11 (see 5.3.12).

(19) X-Y Recorder output function does not operate

Check the circuits of Z12 (see 5.3.13) and Z7 (see 5.3.9).

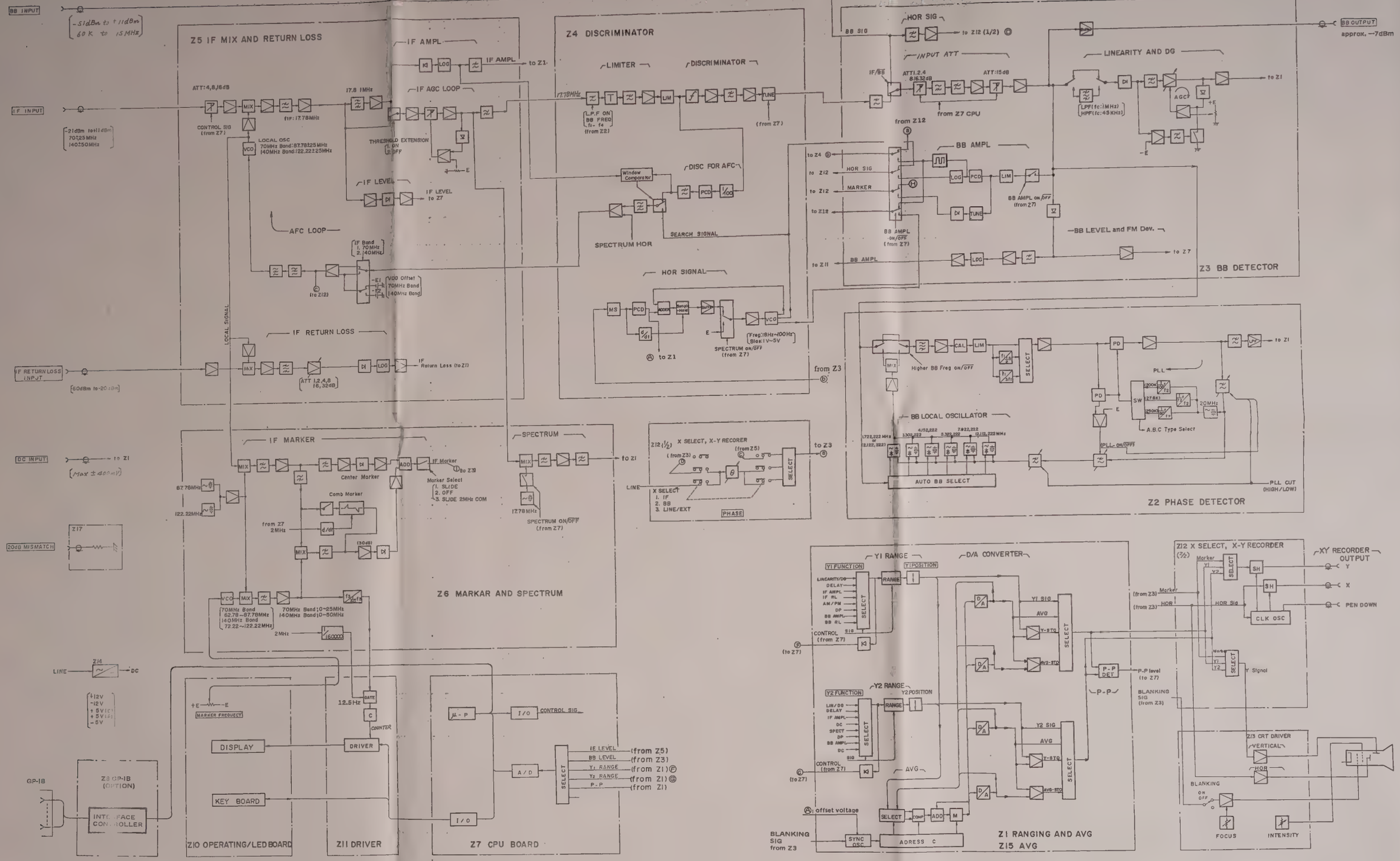
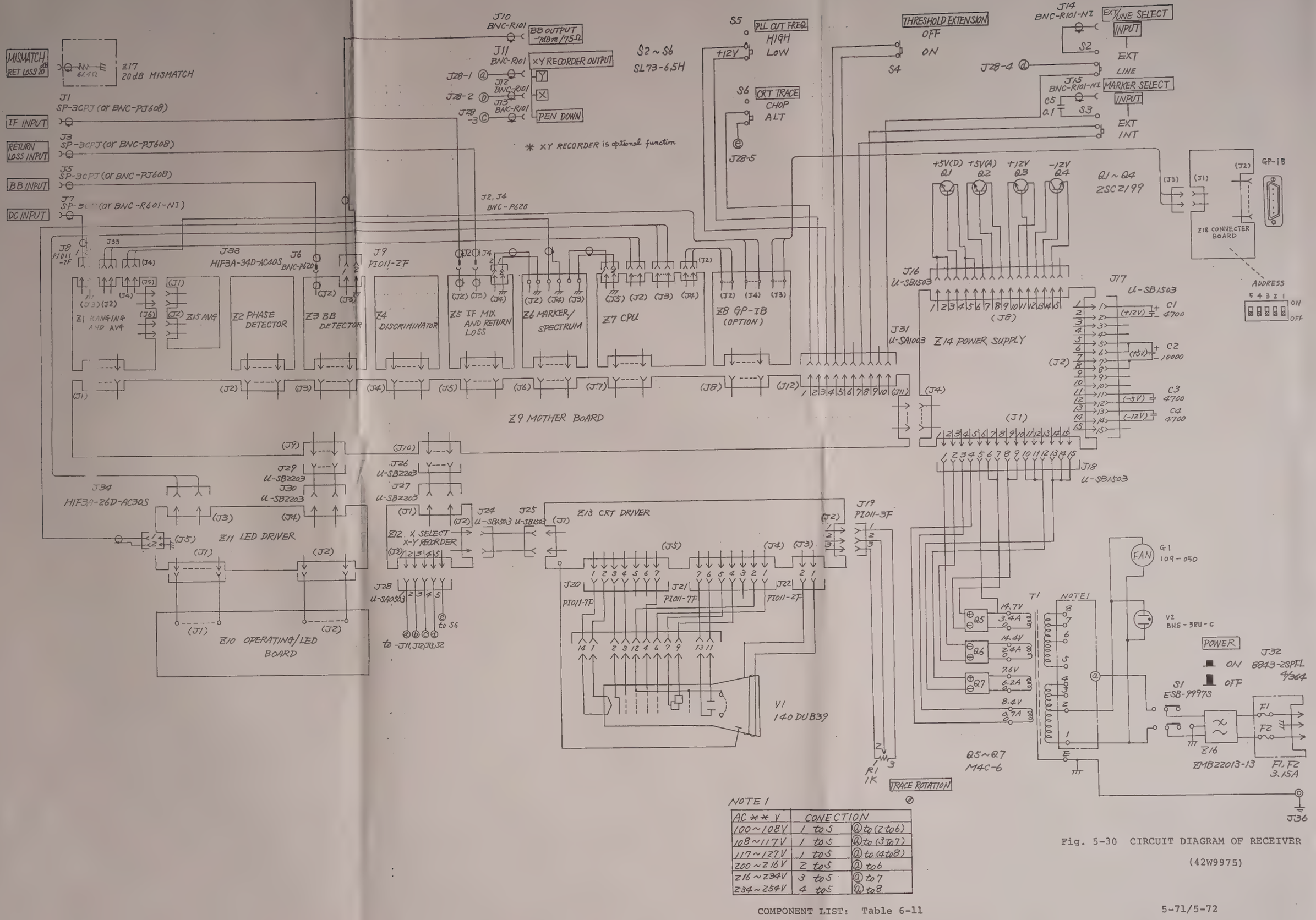


Fig. 5-29 BLOCK DIAGRAM OF RECEIVER



NOTE 1

AC ** V	CONECTION	
100~108V	1 to 5	ⓐ to (2 to 6)
108~117V	1 to 5	ⓐ to (3 to 7)
117~127V	1 to 5	ⓐ to (4 to 8)
200~216V	2 to 5	ⓐ to 6
216~234V	3 to 5	ⓐ to 7
234~254V	4 to 5	ⓐ to 8

Fig. 5-30 CIRCUIT DIAGRAM OF RECEIVER

(42W9975)

COMPONENT LIST: Table 6-11

5.3.3 Z1 RANGING AND AVG

(1) Circuit description

This circuit consists of the circuit for automatically setting the measuring image on the CRT, the circuit for automatically detecting the characteristic deviation, and the normalizer circuit.

AUTOMATIC RANGING CIRCUIT

The scale sensitivity on the CRT must be set according to the measured value to read the characteristics of the measured objects obtained by the frequency sweep method. Consisting of the circuits as shown in Fig. A, this equipment is capable of automatically setting the scale sensitivity on the CRT and digitally displaying the scale sensitivity.

The deviation of characteristics obtained through the detector is detected by the p-p (Peak to Peak) detector, the scale sensitivity in the form that is easiest to read is decided by the microprocessor, the range setting attenuator is controlled, and this value is displayed on the LED at the same time.

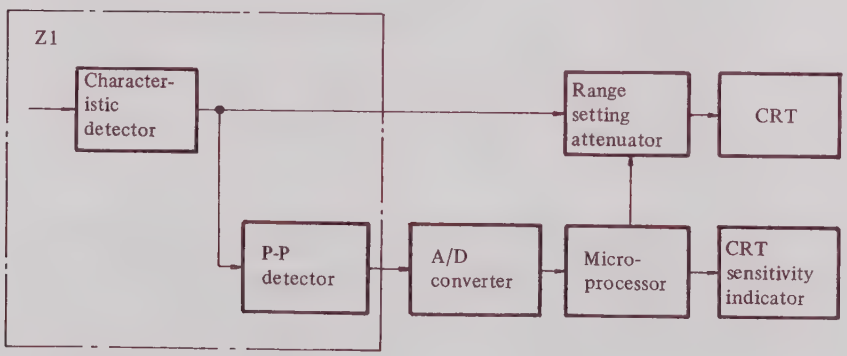


Fig. A BLOCK DIAGRAM OF AUTOMATIC RANGING CIRCUIT

An approximately 20% of overlapping range is provided between ranges within the switchable portion to ensure operational stability. Some measuring items use different units for the CRT scale. For example, ns for delay characteristic, % for linearity and DG (Differential Gain), DEG for DP (Differential Phase), dB for amplitude characteristic, and DEG/dB for AM-PM conversion characteristics, etc. These units may also be automatically displayed on the LED for each measuring item, so that they may be read very earily.

For example, such as adjustments of the out of band characteristics and within pass band characteristics, coarse adjustment while observing the whole characteristics, or fine adjustment while observing partial characteristics, etc., the center frequency or bandwidth must be varied according to the objectives, which causes the characteristic image to change each time. Even in such case, an easy-to-read range can always be set automatically. In addition, this automatic ranging function is also effective where the adjustment point is on the top of the rack which has to be separated from the measuring equipment for adjustment. Y1 channel consists of the RANGE circuit (Q4 through Q6) and p-p detector circuit (Q8 through Q21).

Y2 channel consists of the RANGE circuit (Q25 through Q27) and p-p detector circuit (Q24 through Q31).

Automatic characteristic deviation detector circuit

The transmission characteristic of the object to be measured is often evaluated based on the maximum deviation value of the transmission band amplitude, group delay, and DG, etc. In such case

in the past, the maximum deviation value was visually read from the image being displayed on the CRT. This naturally resulted in many read errors and no quick measurement could be expected. By employing the circuit composition as shown in Fig. B below, this equipment displays the deviation value directly and quickly. For example, measurement of the p-p value of the delay characteristic requires a wide display range of 0.1 ns to 400 ns. This equipment has an automatic ranging circuit placed before the p-p detector and this circuit is always operated when displaying the p-p value, thereby reducing the load on the p-p detector and enabling accurate display in a wide range. In such case, the p-p value to be digitally displayed is obtained through a calculation of the output level of the p-p detector and setting conditions of the automatic ranging circuit.

The p-p detector circuit selects Y1 and Y2 using the selector (Q70), detects the positive peak value with Q71 and negative peak value with Q72, adds both values with Q71, and sends it to Z7 CPU.

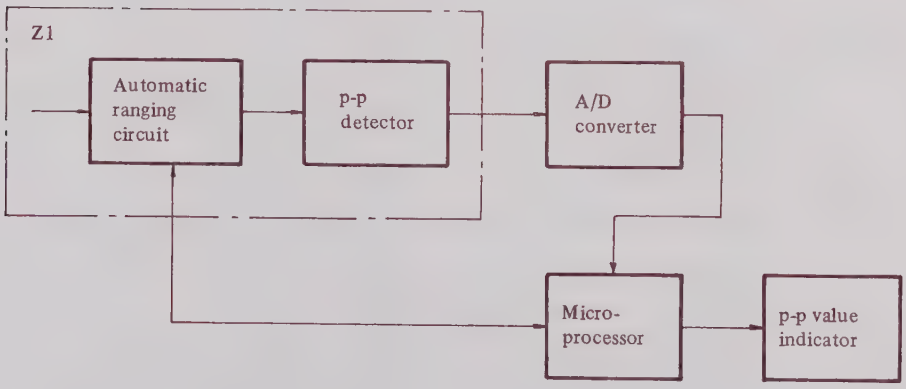


Fig. B BLOCK DIAGRAM OF P-P DEVIATION DETECTOR

Normalizer circuit

When the frequency sweep method is employed for a measurement, the deviation of the measuring system containing the internal deviation of the measuring equipment is added to the image to be measured and the correct characteristics of the object to be measured may not be readily observable. To cope with this problem, this equipment is provided with the normalizer function for temporarily storing the deviation of the measuring system and subtracting it from the measured result for display. The basic block diagram of this function is shown in Fig. C.

The address counter which specifies the address of the memory corresponding to the horizontal axis frequency is driven by the voltage control oscillator synchronized with the horizontal axis sweep signal. Therefore, all addresses of the memory can be aligned with the horizontal axis of the CRT correctly even if the frequency of the horizontal axis sweep signal is changed. The A/D converter is not used in writing the deviation of the measuring system into the memory. Only when there is difference between the analog output of the D/A converter and the input Y axis signal, the least significant digit is corrected for each sweep using an adder/subtractor. Therefore, the Y axis signal data stored in the memory corresponds to the average value of the input signals for each frequency without random noise. To subtract and display the deviation of the measuring system, the contents of the memory thus obtained must be fixed and its output must be analogously subtracted from the Y axis input signal.

As described earlier, the noise components in the data accumulated in the memory are averaged. Therefore, when the data are connected to the CRT through the D/A converter, a clear image can be obtained even when a noisy signal is received. This can be expressed by formular (1) below, supposing the signal-to-noise ratio before improvement to be $(S/N)_1$ and that after improvement to be $(S/N)_2$.

$$(S/N)_2 = 20 \log \sqrt{n}\ (S/N)_1 \quad \ldots\ldots\ldots \quad (1)$$

Here, n is the Averaging Factor. This equipment may allocate 2,000 Y axis dispersions (Memory: 11 bits) for noise in full scale of the CRT and such noise can be improved by 33 dB. This is another important feature of the normalizer function, which is highly effective in measuring low C/N signals such as satellite system.

The circuits are located on the Z1 and Z15 AVG.

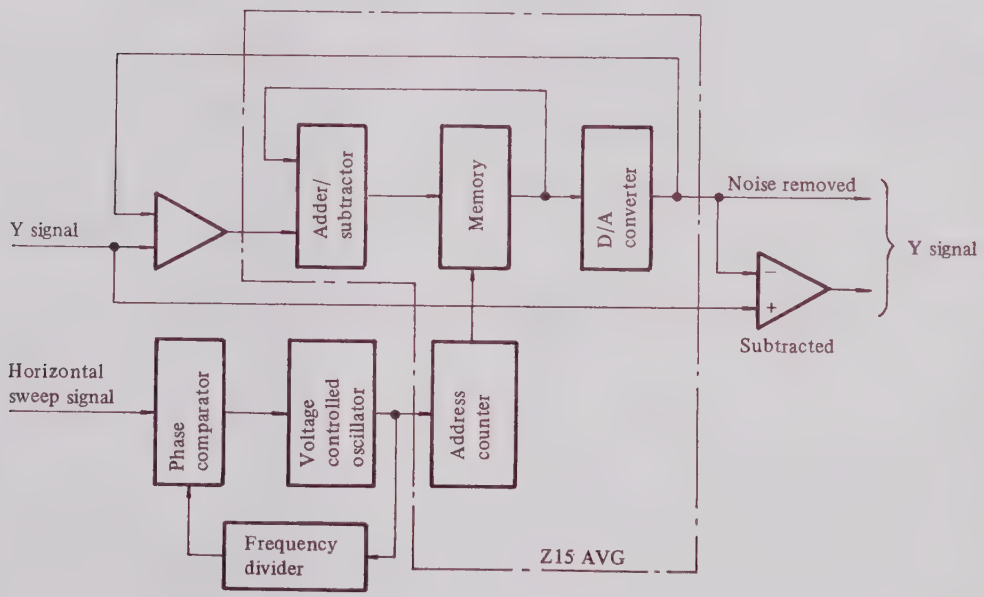
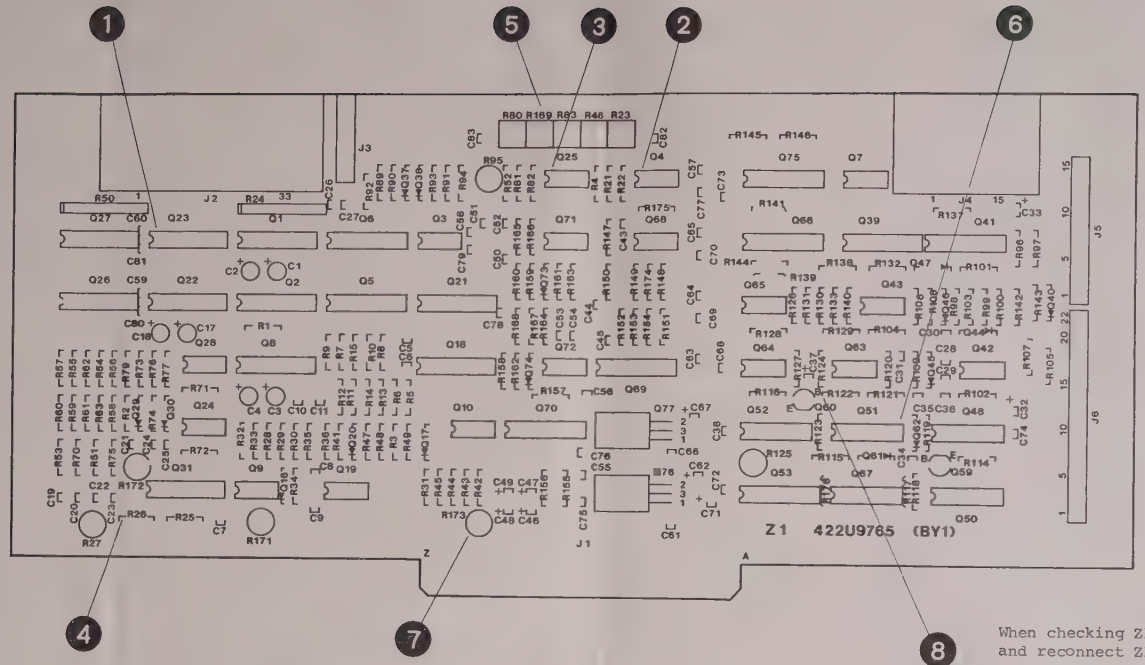


Fig. C Basic block diagram of normalizer function



When checking Z1, remove Z15 from Z1 and reconnect Z15 at a right angle to Z1.

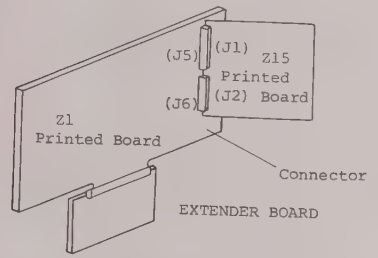
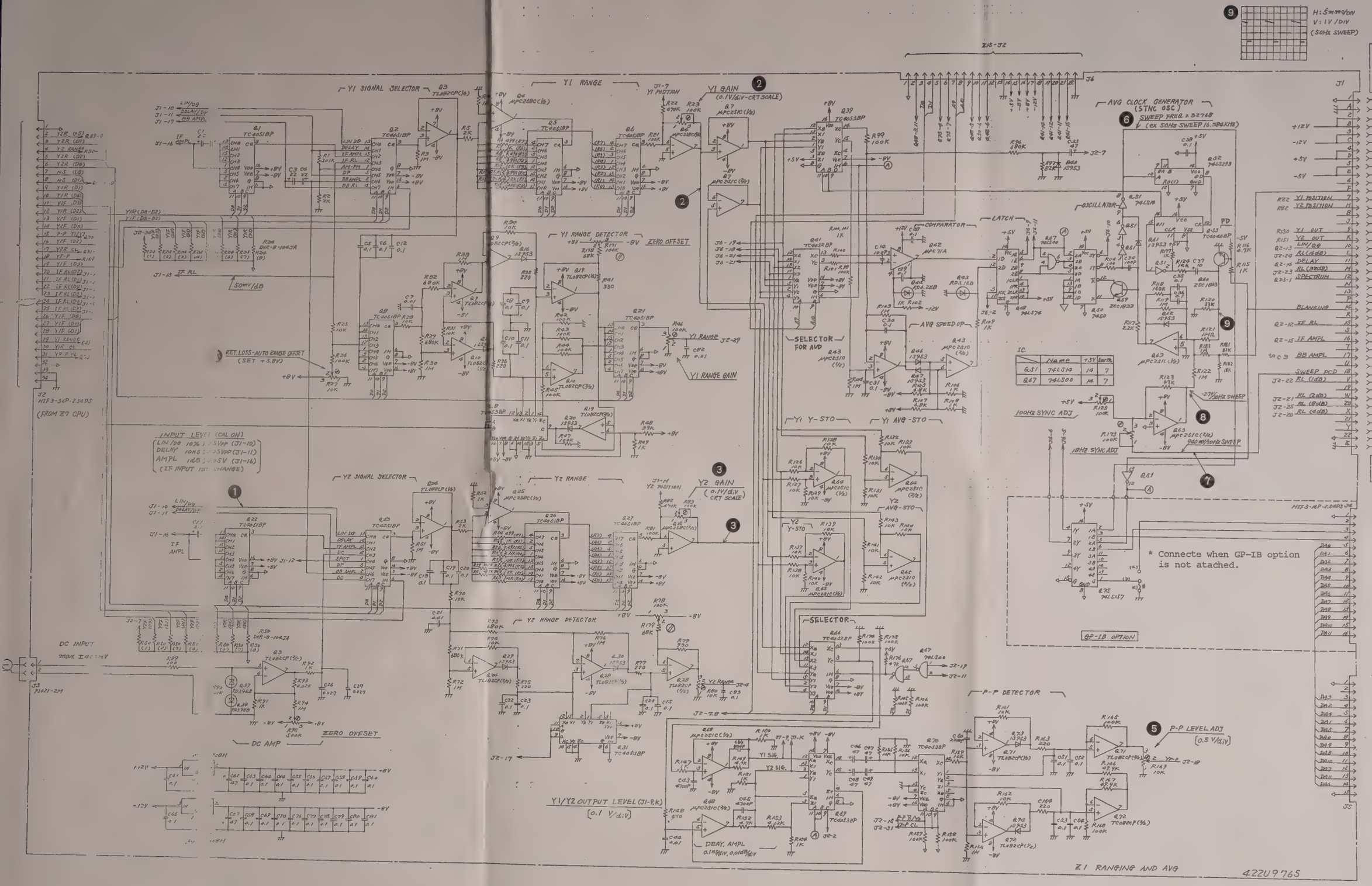


Fig. 5-31 Component Location of Z1



COMPONENT LIST: Table 6-12

Fig. 5-32 CIRCUIT DIAGRAM OF Z1 RANGING AND AVG (RECEIVER)

(41W1305)

5-79/5-80

5.3.4 Z2 PHASE DETDCTOR

(1) Circuit description

BB FREQ DETECTOR detects the frequency of the input BB signal ❻ (J1-Y) and sends it to Z7 CPU. The BB FREQ detector also controls the BB local oscillator and FREQ divider and multiplier using the frequency information.

BB input signal ❻ (J1-Y): The frequency of the BB input signal ❻ (J1-Y) is converted by the mixer (Z1) and FREQ divider and multiplier (Q17 through Q25).

Its frequencies are as shown in the following table.

PD Input Frequency

	Input BB frequency		Input frequency of Phase Detector
f1	A type	66.667 kHz	200.000 kHz
	B type	92.593 kHz	277.778 kHz
	C type	83.333 kHz	250.000 kHz
f2	A type	200.000 kHz	200.000 kHz
	B type	277.778 kHz	277.778 kHz
	C type	250.000 kHz	250.000 kHz
f3	A type	400.000 kHz	200.000 kHz
	B type	555.555 kHz	277.778 kHz
	C type	500.000 kHz	250.000 kHz
f4	A type	2 MHz	277.778 kHz
	B,C type	2.4 MHz	
f5	3.58 MHz		
f6	4.43 MHz		
f7	5.6 MHz		
f8	8.2 MHz		
f9	12.39 MHz		

PLL is formed by returning the phase deviation detected by the phase detector (Q43) to VCO (Q48, Q49) via DC AMP (Q38) and LPF.

BB LOCAL OSC is the circuit for generating the signal for converting the BB higher frequency (f4 through f9) to 277.778 kHz, and its oscillating frequency is controlled by the output voltage of the phase detector (Q43).

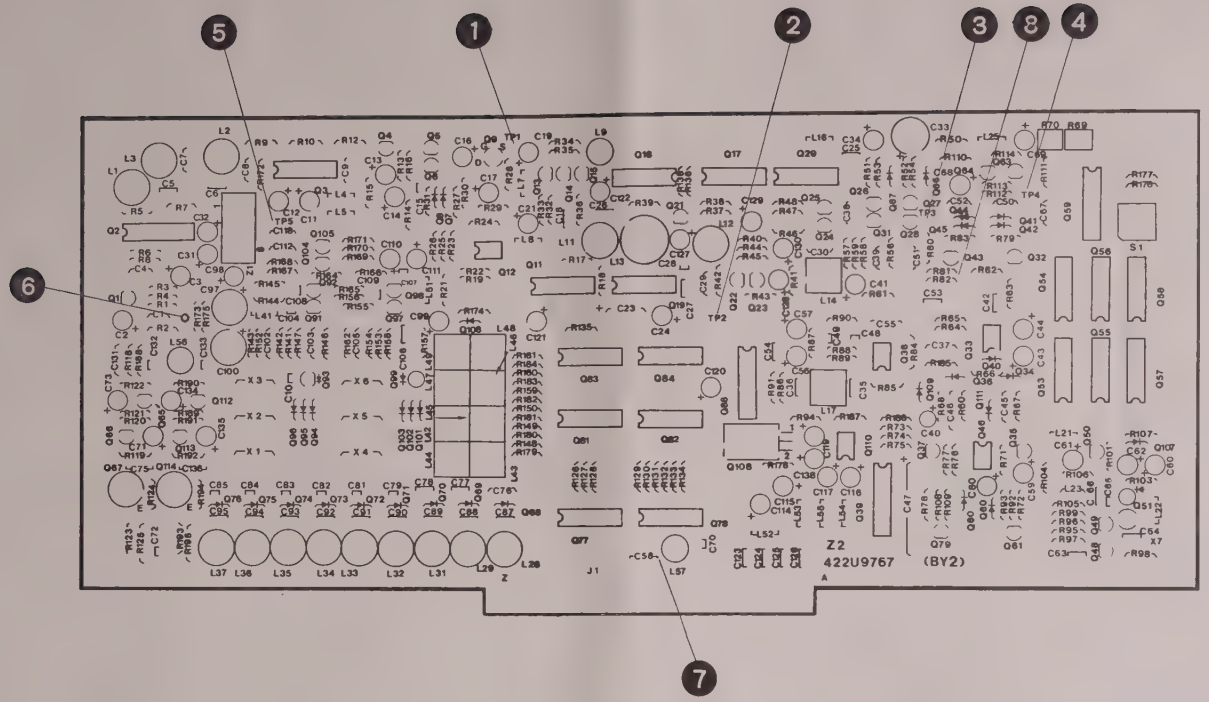
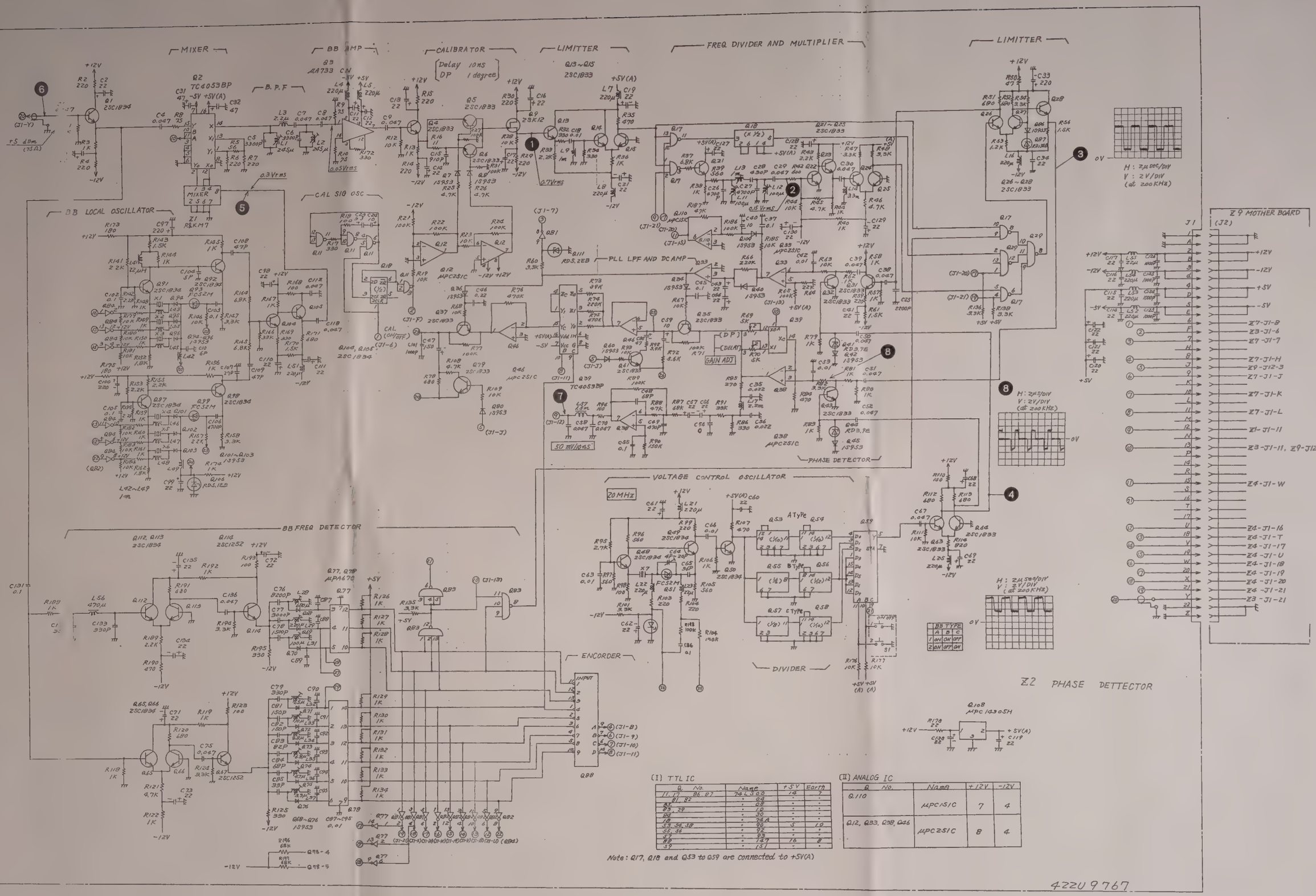


Fig. 5-33 Component Location of Z2



COMPONENT LIST: Table 6-13

Fig. 5-34 CIRCUIT DIAGRAM OF Z2 PHASE DETECTOR (RECEIVER)

(41W1275)

5-85/5-86

5.3.5 Z3 BB DETECTOR

(1) Circuit description

This circuit consists of the BB level detector, linearity (DG) detector, and BB amplitude detector.

BB attenuator is automatically set by the control signal from Z7 CPU so that the deviation of the BB signal level is within ±1.0 dB at the input of the BB level detector.

BB level detector uses a detector circuit (Q21) of stable dc feedback type and transmits the detected signal to Z7 CPU.

Linearity (DG) detector consists of a dc feedback type fullwave detector circuit (Q27).

PEAK AGC detects the peak value (Q28) of the detected linearity (DG) signal, controls the variable attenuator (Q27, Q34) to keep the value always constant, and to form a loop.

BB AMPL section consists of the DC amplifier of BB AMPL, logarithm amplifier, HOR circuit, and marker circuit.

HOR SIGNAL is obtained by converting the frequency of the input signal to voltage using the pulse count discriminator (Q55 through Q58) and further converting it to logerithm using the logarithm amplifier (Q63).

MARKER detects the frequency of the input signal using the tuning circuit and sends it to the CRT.

The tuning frequency is as shown below.

	f1	f2	f3	f4	f5	f6	f7
Frequency	66.7kHz	100kHz	300kHz	1.0MHz	3.0MHz	10.0MHz	15MHz
Circuit	C60 L18	C62 L19	C64 L20	C66 L21	C68 L22	C70,71 L23	C73,74 L24

(2) Repair

1. **BB INPUT LEVEL display is abnormal**

Set RECEIVER MODE to BB.

Apply the BB signal (0 dBm) to BB INPUT.

case 1 → **BB ATTENATOR and BB AMPLIFIER are abnormal**

Check the levels at C14 and ❶.

case 2 → **BB LEVEL DETECTOR is abnormal**

Check the voltages at Q21-7 and ❷.

2. **Linearity and DG can not be measured**

Set RECEIVER MODE to BB.

Apply the BB signal (0 dBm) to BB INPUT.

case 1 → **BB INPUT LEVEL display is abnormal**

Check item (1).

case 2 → **LINEARITY DETECTOR and AGC AMP are abnormal**

Check the vaoltages of ❸ and ❹.

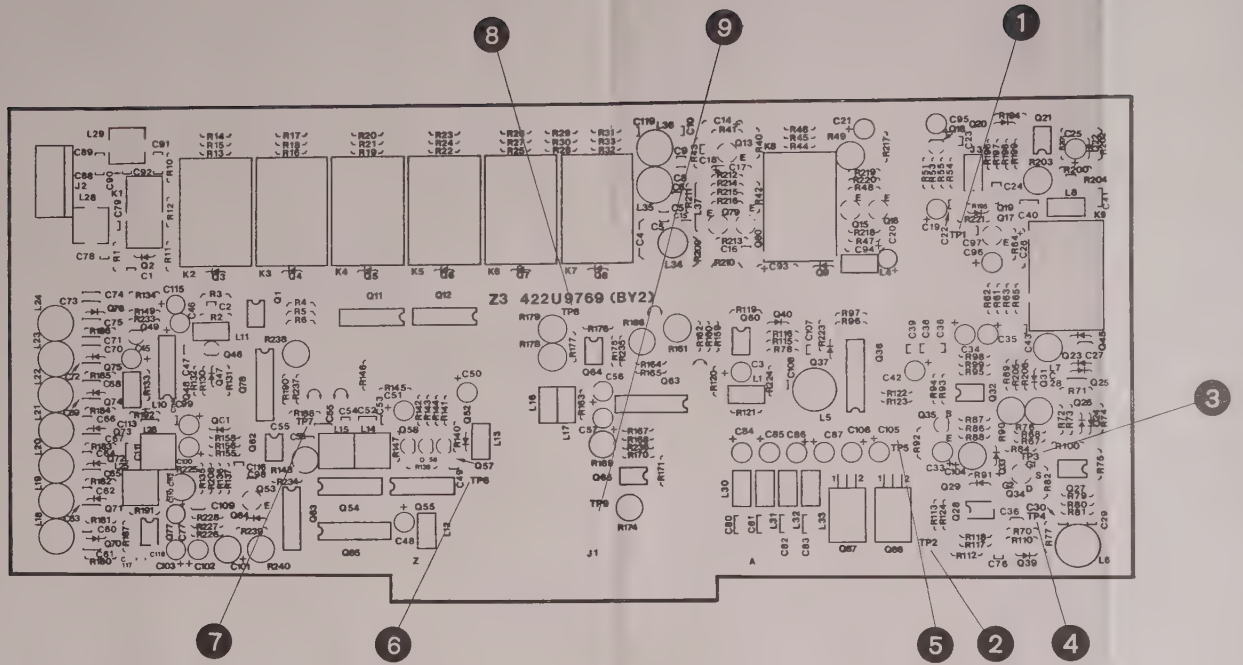


Fig. 5-35 Component Location of Z3

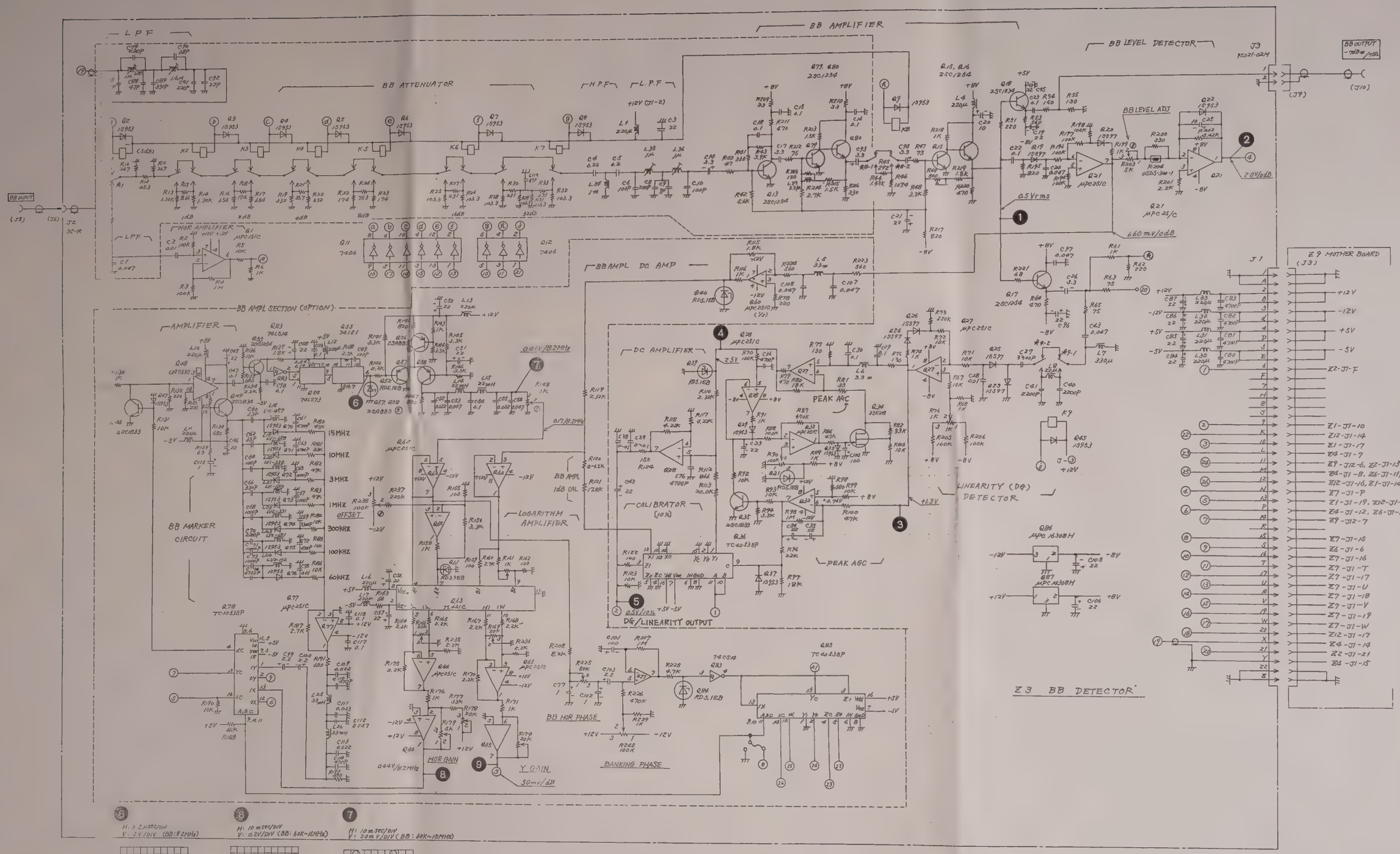


Fig. 5-36 CIRCUIT DIAGRAM OF Z3
BB DETECTOR (RECEIVER)

(41W1276)

COMPONENT LIST: Table 6-14

5-91/5-92

5.3.6 Z4 DISCRIMINATOR

(1) Circuit description

This circuit consists of a discriminator which demodulates the BB signal from 17.78 MHz IF signal, pulse count detector for AFC, and HOR signal generator.

17.78 MHz IF signal: The spurious of the 17.78 MHz IF signal is removed by the low pass filter (L27, L28), the AM components of the 17.78 MHz IF signal are removed by the limiter (Q28), and the BB signal is demodulated by the discriminator (Q1 through Q3).

BB signal: The spurious of the BB signal is removed by the low pass filter (L7 through L9) and the BB signal is sent to Z3 BB detector via the BB amplifier (Q6, Q7) and tuning circuit.

AFC LOOP is formed by converting the frequency of the 17.78 MHz IF signal to voltage using the pulse count discriminator (Q43 through Q46) and returning the signal to the local oscillator (Z5) via DC amplifier (Q55).

HOR signal generator is the circuit for generating the HOR signal synchronized with the sweep signal.

PLL is formed by detecting the phase deviation of the output signal of the voltage control oscillator for the sweep signal with the phase detector (Q54, Q67) that uses the sample hold circuit and returning the signal to VCO via DC amplifier (Q63, Q64).

(2) Repair

1. **AFC circuit does not operate**

Ground ❼ .

Apply the 70 MHz, 0 dBm signal to IF INPUT.

case 1 → **LIMITER is abnormal.**

Check the level of ❷ .

case 2 → **P.C.D is abnormal.**

Check the level of ❺ , pulse-width of ❻ , and voltage of R116.

→ **AFC LOOP is abnormal.**

Disconnect ❼ from the ground line, and adjust R142 checking the voltage of ❼ .

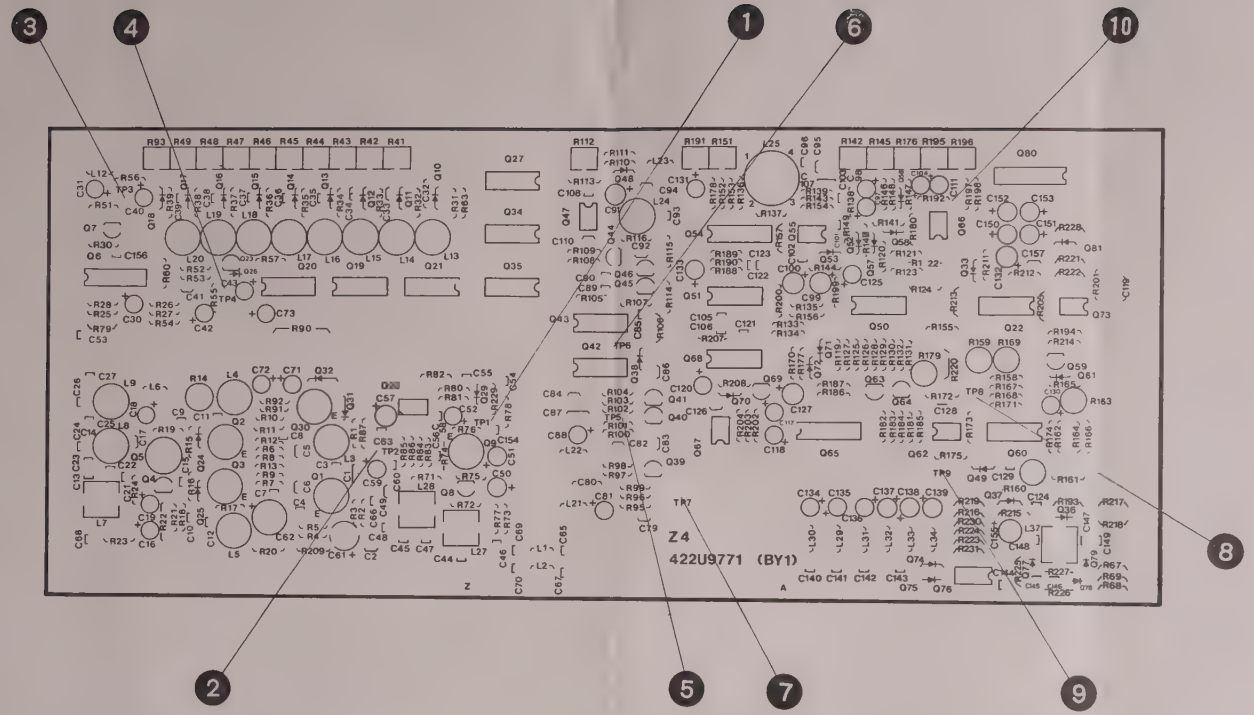
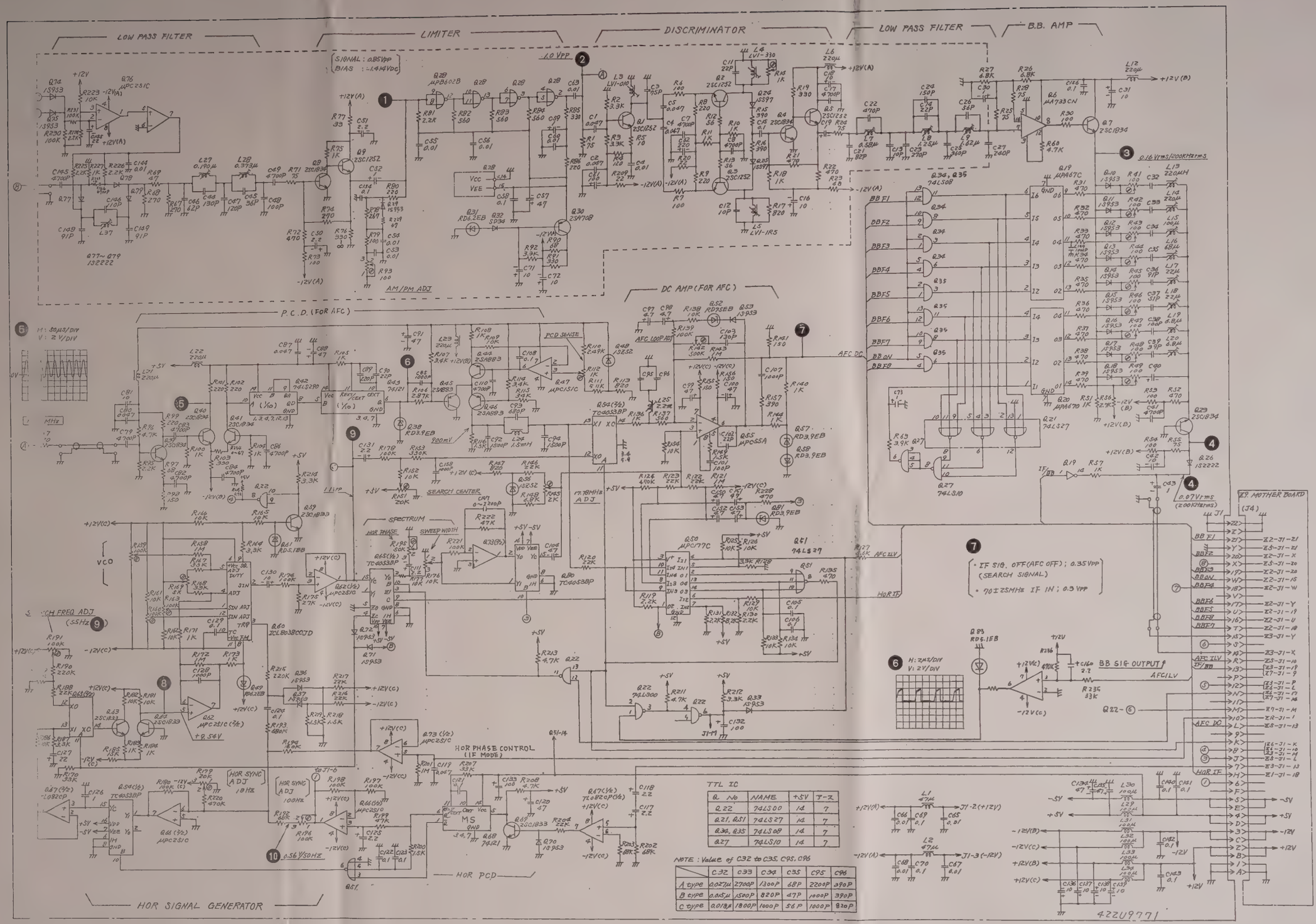


Fig. 5-37 Component Location of Z4



COMPONENT LIST: Table 6-15

TTL IC			
Q No	NAME	+5V	T-Z
Q22	74LS00	14	7
Q21, Q51	74LS27	14	7
Q34, Q35	74LS08	14	7
Q27	74LS10	14	7

NOTE : Value of C32 to C35, C95, C96

	C32	C33	C34	C35	C95	C96
A type	0.027μ	2700P	1300P	68P	2200P	390P
B type	0.015μ	1500P	820P	47P	1000P	390P
C type	0.018μ	1800P	1000P	56P	1000P	820P

Fig. 5-38 CIRCUIT DIAGRAM OF Z4 DISCRIMINATOR (RECEIVER)

(41W1300)

5-97/5-98

5.3.7 Z5 IF MIX AND RETURN LOSS

(1) Circuit description

This circuit consists of the IF local oscillator, IF level detector, IF amplitude detector, and IF return loss detector.

IF signal is set to a fixed by the IF attenuator (K1 through K3) which is controlled by Z7 CPU and is sent to the mixer (Z1) via the pre-amplifier (Q5, Q6).

IF local oscillator (Q14, Q15) is a voltage control oscillator for oscillating the following frequencies:

70 MHz band: 87.78 ±25 MHz or more
140 MHz band: 122.22 ±50 MHz or more

The IF local oscillator is controlled by the AFC loop to keep the frequency of the 17.78 MHz IF signal of the mixer (Z1) output constant.

17.78 MHz IF signal is sent to the AGC circuit (Q45 through Q55) via the amplifier (Q27) after its spurious having been removed by the LPF (L9 through L11).

IF level detector (Q37, Q38) uses a detector (Q38) of stable dc feedback type and sends the detected signal to Z7 CPU.

IF amplitude detector (Q56 through Q64) uses a detector (Q58) of stable dc feedback type, which converts the detected signal to logarithm using the logarithm amplifier (Q59) and sends it to the CRT.

IF return loss circuit consists of a mixer (Z2) for converting the IF input signal to 17.78 MHz signal, return loss offset amplifier, and level detector.

Return loss offset amplifier (Q71 through Q85): The gain of this amplifier is set by the control signal of Z7 CPU.

(2) Repair

1. **AFC circuit does not operate**

   Apply the 70 MHz, 0 dBm signal to J2.
   Remove Z4 P.C. Board.
   Set the IF BAND select switch to 70 MHz.

   - case 1 → **IF ATTENUATOR and IF PRE-AMP are abnormal**
     Check the voltage of ❶.
   - case 2 → **17.8 MHz AMP is abnormal.**
     Check the levels of ❷ and ❸.
   - case 3 → **AGC does not operate**
     Check the level of ❻.
   - case 4 → **AFC circuit does not operate**
     Check Z4.

2. **IF Amplitude can not be measured.**

   Apply the 70 MHz, 0 dBm signal to J2.

   - case 1 → **AFC circuit does not operate**
     Check item (1).
   - case 2 → **IF AMPLITUDE DETECTOR is abnormal.**
     Check the voltages of ❼ to ❿

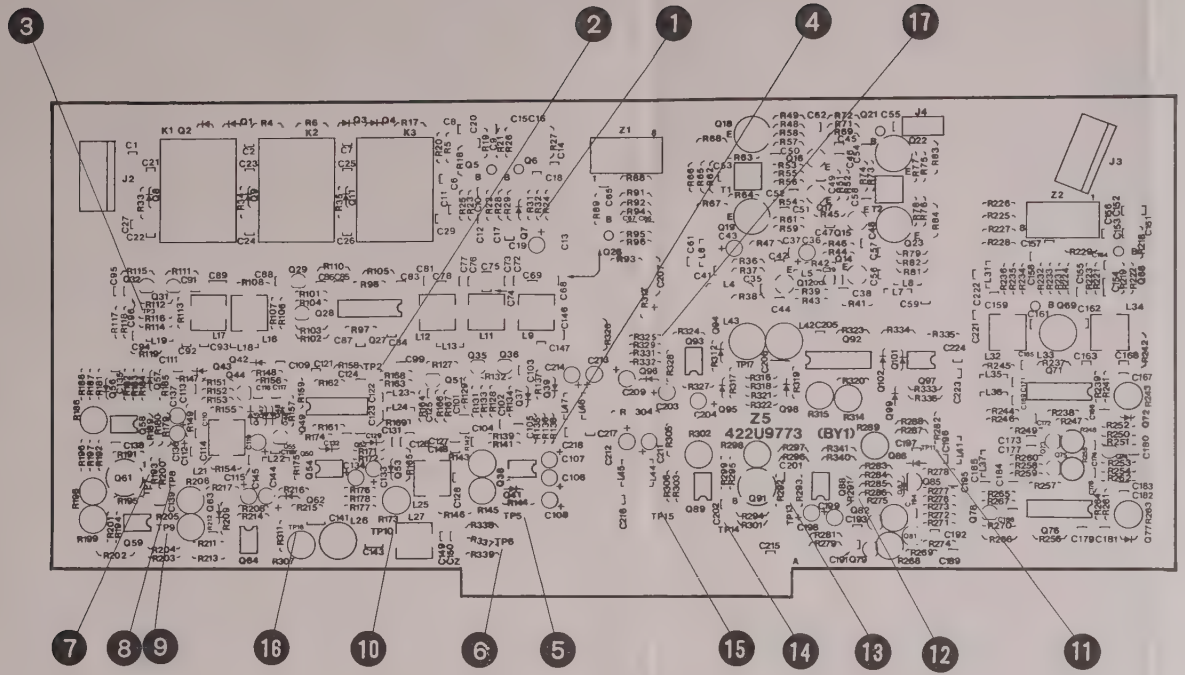
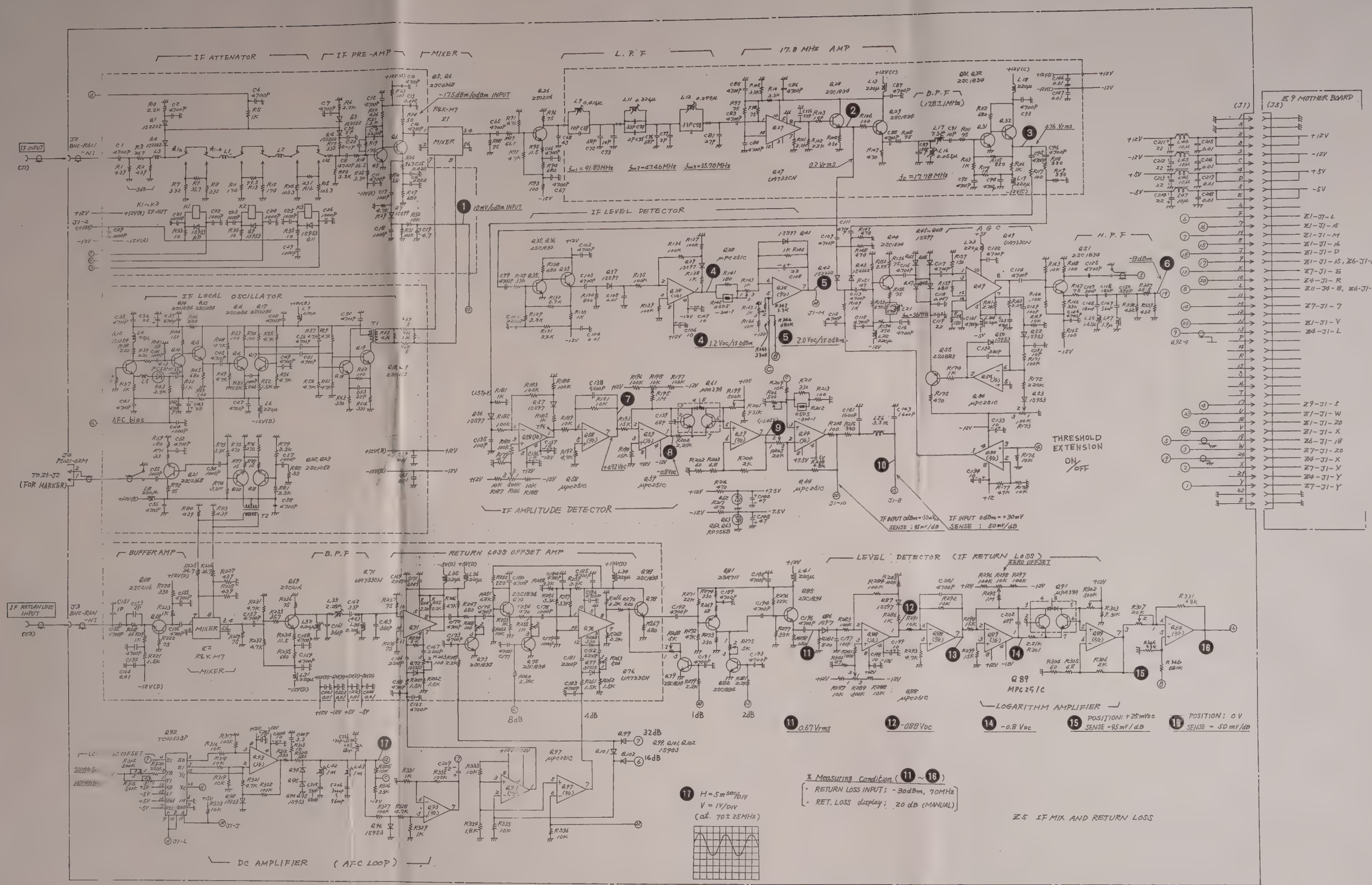


Fig. 5-39 Component Location of Z5



COMPONENT LIST: Table 6-16

Fig. 5-40 CIRCUIT DIAGRAM OF Z5 IF MIX AND RETURN LOSS (RECEIVER)

(41W1277)

5.3.8 Z6 MARKER AND SPECTRUM

(1) Circuit description

Z5 local oscillator output signal (J2) is mixed with the crystal OSC signal by the mixer (Z1) and converted into 0 to 50 MHz signal.

CENTER MARKER is obtained by limiting the bandwidth of the amplifier (Q34) output signal using the LPF (L2) and amplifying it by Q36.

Its signal is mixed with the 2 MHz COMB marker and slide marker signal and sent to Z13 CRT.

2 MHz COMB MARKER is obtained by mixing the 2 MHz signal of J3 with the output signal of the amplifier (Q34) by the harmonic mixer (Q26). Its signal is amplified (Q27), its bandwidth is limited by the LPF (L21), and then mixed with the center marker through the amplifier (Q29).

SLIDE MARKER signal is obtained by mixing (Z2) the output signal of VCO (Q13, Q14) and the crystal OSC signal.

Band	VCO oscillator frequency	Mixer output
70 MHz	87.78 ∿ 62.78 MHz	0 ∿ 25 MHz
140 MHz	122.22 ∿ 72.22 MHz	0 ∿ 50 MHz

The output signal is amplified (Q39) and sent to the mixer (Z3).

SLIDE MARKER is obtained by limiting the bandwidth of the mixer (Z3) output signal using the LPF (L23) and mixing with the 2 MHz COMB MARKER by the amplifier (Q29).

MARKER CHECK converts the sweep signal demodulated by Z5 to the square wave with Q44, turns on Q33 and Q38 for only half cycle when

MARKER CHECK is ON (J1-9: 0 V), and erases the marker. This marker erase timing corresponds to the right half of the CRT.

SLIDE MARKER counting signal is obtained by dividing (Q41 through Q43) the SLIDE MARKER signal (output of Q39) into 1/40 and is sent to Z11 via J4.

Counter gate signal is obtained by dividing (Q18 through Q21) the 2 MHz CLOCK into $1/16 \times 10^4$ and is sent to Z11 via J1-13.

SPECTRUM is obtained by mixing the 17.78 MHz crystal oscillator (Q54, Q55) signal with the 17.78 MHz IF signal swept by approximately ±700 kHz using the mixer (Q59).

The bandwidth of the mixer output signal is limited by the LPF (L31, L32 and L33), amplified by Q61 and Q62, and sent to Z13 CRT.

J1-20 (20) will become +5 V when the spectrum is ON.

(2) Repair

1. **Slide Marker does not function**

Apply the 80 MHz, 0 dBm signal to IF INPUT.

Set IF BAND to 70 MHz and MARKER to SLIDE.

case 1 → **87.78 MHz CRYSTAL OSCILLATOR is abnormal**

Check the frequency and level of ❶ .

case 2 → **VCO is abnormal**

Check that the voltage of R148 varies in negative potential when the MARKER FREQUENCY knob on the front panel varies.

Check that oscillation frequency at ❷ is in 87.78 to 137.78 MHz or more when the MARKER FREQUENCY knob on the front panel varies.

case 3 → **MIXER is abnormal**

Set the frequency of ❷ to 97.78 MHz.

Check the frequencies of ❸ and ❺ .

Check the frequency and level of ❹ .

2. **Spectrum cannot be measured**

Apply the 70 MHz, 0 dBm signal to IF INPUT.

Set IF BAND to 70 MHz.

case 1 → **17.78 MHz CRYSTAL OSCILLATOR is abnormal.**

Check the frequency and level of ❼ .

case 2 → **AFC circuit does not operate**

Check the operation of Z4 and Z5.

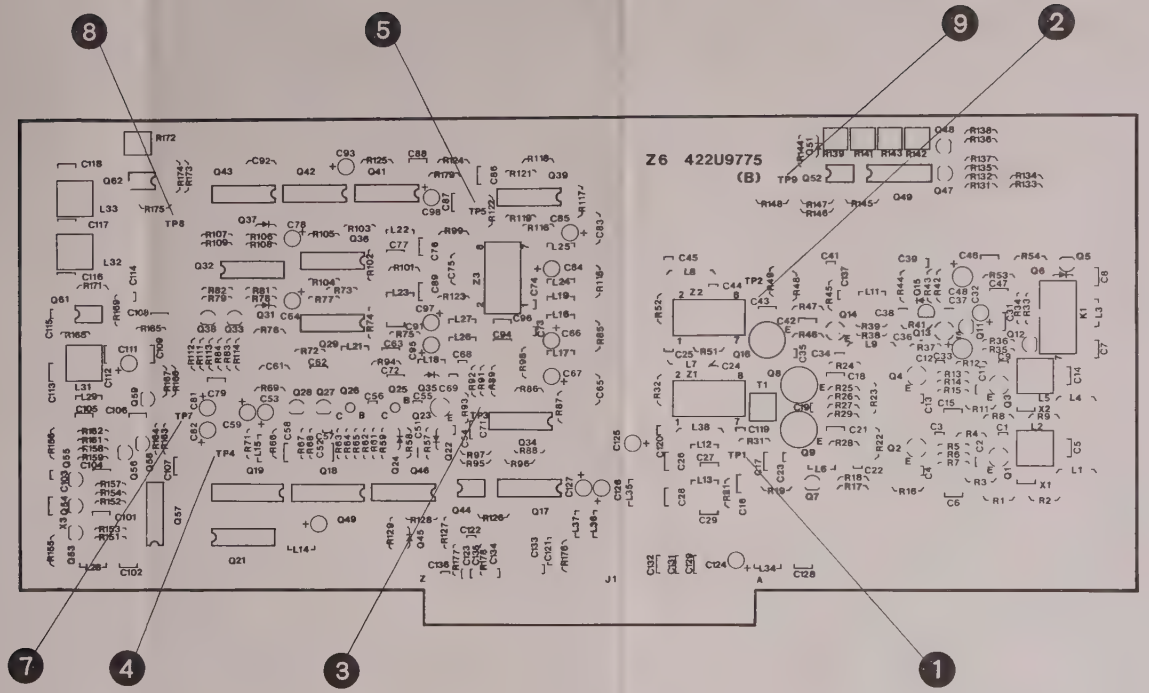
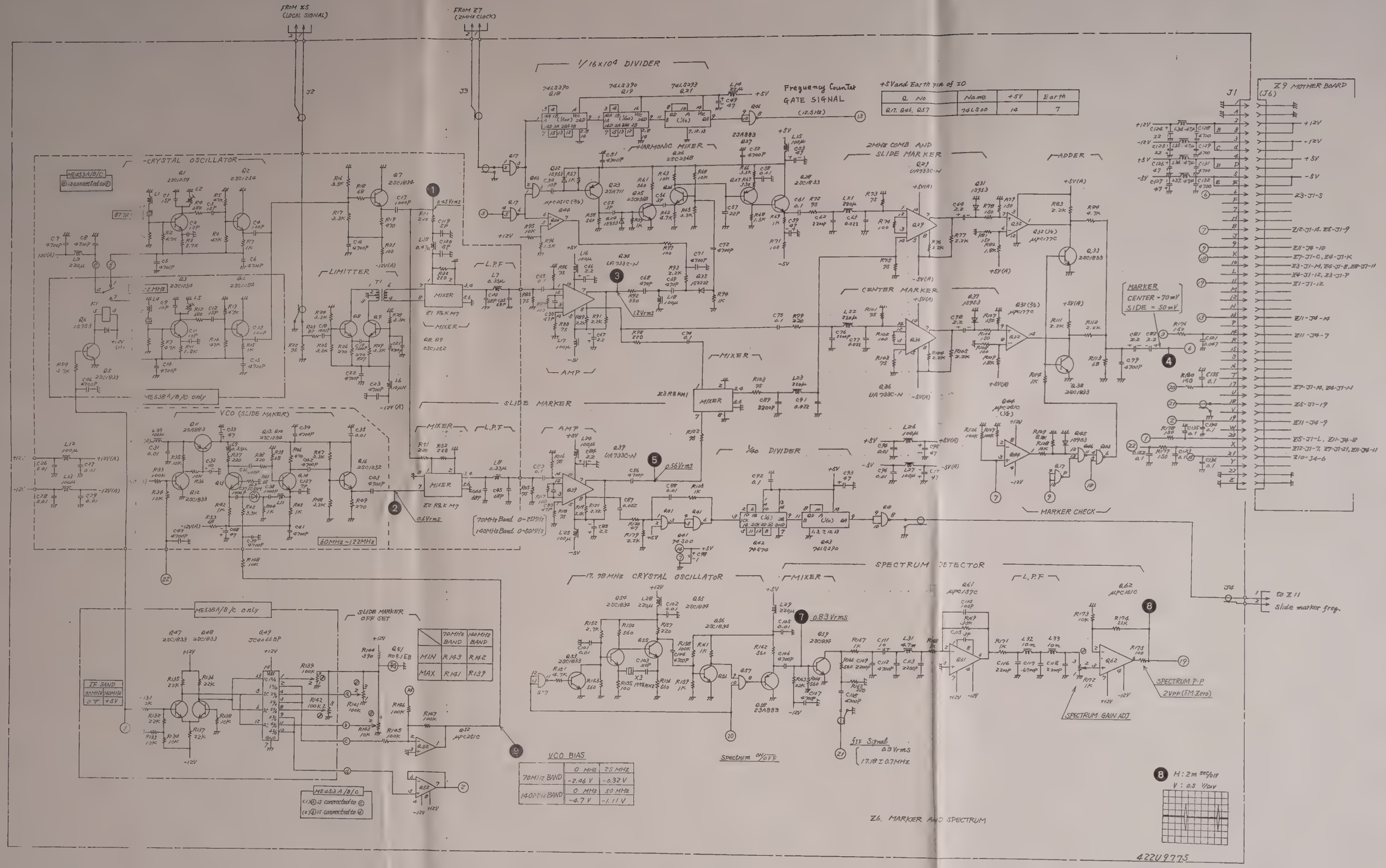


Fig. 5-41 Component Location of Z6



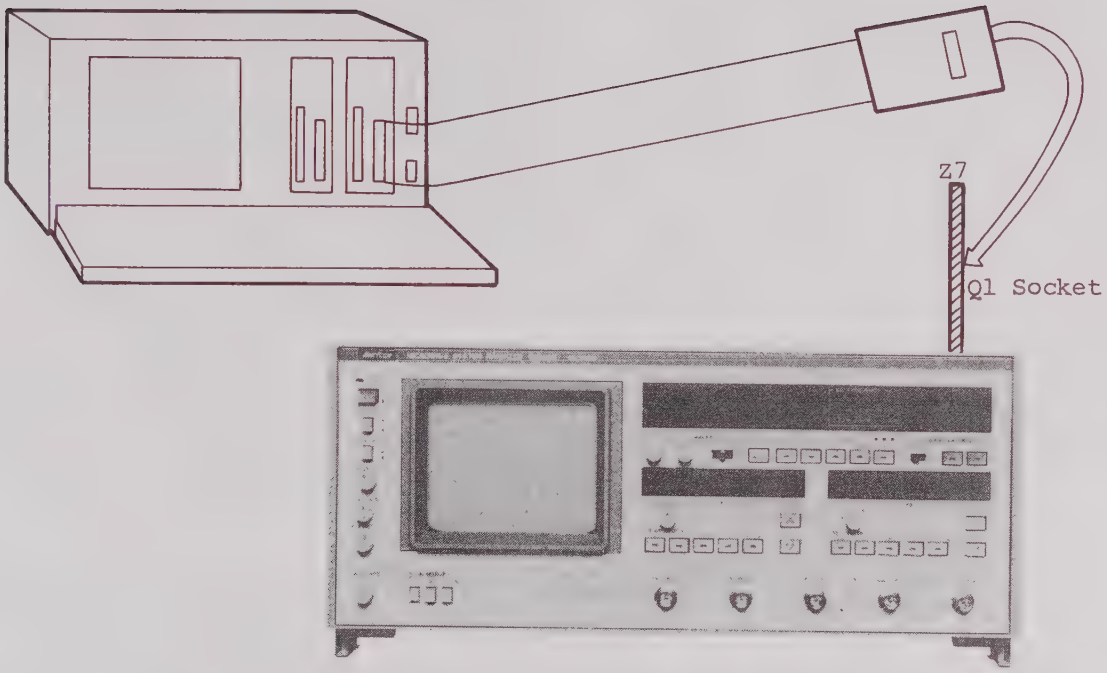
COMPONENT LIST: Table 6-17

Fig. 5-42 CIRCUIT DIAGRAM OF Z6 MARKER AND SPECTRUM (RECEIVER)

(41W1278)

(2) I/O port function check using the μP-ANALYZER MA-1008

IWATSU
MA-1008



Instead of μPD8085A, connect the probe of the MA-1008 to socket Z7-Q1 as shown above.

If the CPU stops operation, detect the malfunctioning I/O port by checking each function according to the Table 5-2.

5.3.9 Z7 CPU

(1) Circuit description

This circuit, consisting of the CPU (Q1), ROM (Q2 through Q4), and I/O ports, is used to control individual circuits and process data. The major function of this circuit are as follows:

1. Controlling IF INPUT LEVEL and data processing
2. Controlling BB INPUT LEVEL and data processing
3. Calculating FM DEVIATION
4. Automatic ranging Y1/Y2 channels
5. Calibrating return loss and FM deviation
6. LED display
7. Key input

Address of CPU is shown in Table 5-2 List of CPU address allocations.

8279 I/O port controls the input/output data of the front panel. The input data are shown in Table 5-3. The input data and output data used for controlling individual circuits are shown in Table 5-4, 5-5.

·Table 5-3 8279 LSI input data allocation

Return Line / M-Scan Line		0	1	2	3	4	5	6	7
Group 1 (Y1 FUNCTION)	0		Linearity, DG	Delay, DP	AMPL	R.LOSS	AM-PM		
			01H	02H	03H	04H	05H		
Group 2 (Y2 FUNCTION)	1		Linearity, DG	Delay, DP	AMPL	DC	SPECTRUM		
			01H	02H	03H	04H	05H		
Group 3 (Receiving Mode)	2		IF	BB					
			01H	02H					
Group 4 (Range Mode)	3		Auto	Manual					
			01H	02H					
Group 5	4		Peak-Peak						
			01H						
Group 6	5		Noise Suppress						
			01H						
Group 7	6		CAL						
			01H						
Group 8	7		Y1 ↑	Y1 ↓	Y2 ↑	Y2 ↓			
			01H	02H	03H	04H			

Table 5-2 List of CPU address allocations

Item	Circuit Reference	State			Address bit															Address
		IO/$\overline{M}$	$\overline{RD}$	$\overline{WR}$	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0	
1. Program																					
① ROM No.1 2k Byte	Q2	0	0	-	0	0	0	0	0												0000 H ~ 07FF H
② ROM No.2 2k Byte	Q3	0	0	-	0	0	0	0	1												0800 H ~ 0FFF H
③ ROM No.3 2k Byte	Q4	0	0	-	0	0	0	1	0												1000 H ~ 17FF H
④ ROM No.4 4k Byte (Option GP-IB)	Q44	0	0	-	0	0	1	0	0												2000 H ~ 2FFF H
2. Data memory																					
① RAM 256 Byte	Q5, Q6	0	-	-	1	0	0	0	0	0	0	0									8000 H ~ 80FF H
3. I/O Port																					
① 8279 key/Display	Q15	0	-	-	1	0	0	0	1	1	0	0									8D**H
② 8253 Timmer	Q17	0	-	-	1	0	0	0	1	1	0	1									8D**H
4. Input ports																					
① A/D Converter	Q18	0	0	-	1	0	0	0	1	1	1	0	0	0	0	0					8E0*H
② PLL/AFC	Q32	0	0	-	1	0	0	0	1	1	1	0	0	0	0	1					8E1*H
③ BB Input Frequency	Q33	0	0	-	1	0	0	0	1	1	1	0	0	0	1	0					8E2*H
④ BB type (A, B, C)	Q33	0	0	-	1	0	0	0	1	1	1	0	0	0	1	1					8E3*H
⑤ X-Y Recorder	Q32	0	0	-	1	0	0	0	1	1	1	0	0	1	0	0					8E4*H
⑥ A/D STATUS/TIMMER OUT	Q31	0	0	-	1	0	0	0	1	1	1	0	0	1	0	1					8E5*H
5. Output ports																					
① IF ATT/AFC	Q22	0	-	0	1	0	0	0	1	1	1	1	0	0	0	0					8F0*H
② BB Input Attenuator	Q23	0	-	0	1	0	0	0	1	1	1	1	0	0	0	1					8F1*H
③ IF Return Loss Offset	Q24	0	-	0	1	0	0	0	1	1	1	1	0	0	1	0					8F2*H
④ Y1 Function Select	Q25	0	-	0	1	0	0	0	1	1	1	1	0	0	1	1					8F3*H
⑤ Y1 Range Select	Q25	0	-	0	1	0	0	0	1	1	1	1	0	1	0	0					8F4*H
⑥ Y2 Function Select	Q26	0	-	0	1	0	0	0	1	1	1	1	0	1	0	1					8F5*H
⑦ Y2 Range Select	Q26	0	-	0	1	0	0	0	1	1	1	1	0	1	1	0					8F6*H
⑧ Noise Suppress Control	Q27	0	-	0	1	0	0	0	1	1	1	1	0	1	1	1					8F7*H
⑨ Recorder Control	Q27	0	-	0	1	0	0	0	1	1	1	1	1	0	0	0					8F8*H
⑩ A/D CONV Input Select	Q16	0	-	0	1	0	0	0	1	1	1	1	1	0	0	1					8F9*H
⑪ Detector Reset	Q16	0	-	0	1	0	0	0	1	1	1	1	1	0	1	0					8FA*H
⑫ HOR Select/Y1, Y2 ON/$\overline{OFF}$	Q34	0	-	0	1	0	0	0	1	1	1	1	1	0	1	1					8FB*H

Table 5-5 Output data

Item	Address	Data Bus	Contents of data	Remarks
① IF ATT/AFC	8F0*H	D0	IF Attenuator	4dB L; on, H; off
		D1	IF Attenuator	8dB L; on, H; off
		D2	IF Attenuator	16dB L; on, H; off
		D6	IF ATT Short	L; Short, H; Open
		D7	AFC start	L; AFC open, H; AFC loop on
② BB Input Attenuator	8F1*H	D0	BB Att- 1	1dB H; on, L; off
		D1	BB Att- 1	2dB H; on, L; off
		D2	BB Att- 1	4dB H; on, L; off
		D3	BB Att- 1	8dB H; on, L; off
		D4	BB Att- 1	16dB H; on, L; off
		D5	BB Att- 1	32dB H; on, L; off
		D6	BB Att- 2	15dB H; on, L; off
		D7	IF/$\overline{BB}$	IF; H, BB; L
③ IF Return Loss Offset	8F2*H	D0	IF RL OFFSET	1dB H; on, L; off
		D1	IF RL OFFSET	2dB H; on, L; off
		D2	IF RL OFFSET	4dB H; on, L; off
		D3	IF RL OFFSET	8dB H; on, L; off
		D4	IF RL OFFSET	16dB H; on, L; off
		D5	IF RL OFFSET	32dB H; on, L; off
		D6		
		D7		
④ Y1 Function Select	8F3*H	D0	Y1 Function	0 1 2 3 4 5 6 7
		D1	Y1 Function	(Linearity DG) (Delay) (IF Ampl) (IF R.C) (AM -PM) (DP) (BB Ampl) (BB R.L)
		D2	Y1 Function	
		D7	Y1 Function	Y1 signal to CRT on; L, off; H
⑤ Y1 Range Select	8F4*H	D0	Y1 Range	
		D1	Y1 Range	
		D2	Y1 Range	

	Range							
	0	1	2	3	4	5	6	7
D0	L	H	L	H	L	H	L	H
D1	L	L	H	H	L	L	H	H
D2	L	L	L	L	H	H	H	H

⑥ Y2 Function Select	8F5*H	D0	Y2 Function	0	1	2	3	4	5	6
		D1	Y2 Function	L/DG	Delay/DP	AMPL-IF	DC	SPECTRUM	DP	BB Ampl
		D2	Y2 Function	L	H	L	H	L	H	L
		D7	Y2 Function	L	L	H	H	L	L	H
				L	L	L	L	H	H	H
				Y2 Signal to CRT on; L, off; H						

Table 5-4 Input data

<table>
<tr><th>Item</th><th>Address</th><th>Data Bus</th><th>Contents of data</th><th>Remarks</th></tr>
<tr><td>① A/D Converter</td><td>8E0*H</td><td>D0
∫
D7</td><td>A/D OUT</td><td>12 bit
MSB LSB
(H byte) × × PL OR D11 D10 D9 D8
MSB LSB
(L byte) D7 D6 D5 D4 D3 D2 D1 D0</td></tr>
<tr><td>② PLL/AFC</td><td>8E1*H</td><td>D0
D7</td><td>PLL ON/OFF
AFC ON/OFF</td><td>PLL on: H
AFC on: H</td></tr>
<tr><td>③ BB Input Frequency</td><td>8E2*H</td><td>D0
D1
D2
D3</td><td>BB freq
BB freq
BB freq
BB freq</td><td>
<table>
<tr><th>f1 (1)</th><th>f2 (2)</th><th>f3 (3)</th><th>f4 (4)</th><th>f5 (5)</th><th>f6 (6)</th><th>f7 (7)</th><th>f8 (8)</th><th>f9 (9)</th></tr>
<tr><td>L</td><td>H</td><td>L</td><td>H</td><td>L</td><td>H</td><td>L</td><td>H</td><td>L</td></tr>
<tr><td>H</td><td>L</td><td>L</td><td>H</td><td>H</td><td>L</td><td>L</td><td>H</td><td>H</td></tr>
<tr><td>H</td><td>H</td><td>H</td><td>L</td><td>L</td><td>L</td><td>L</td><td>H</td><td>H</td></tr>
<tr><td>H</td><td>H</td><td>H</td><td>H</td><td>H</td><td>H</td><td>H</td><td>L</td><td>L</td></tr>
</table>
</td></tr>
<tr><td>④ BB type</td><td>8E3*H</td><td>D0
D1</td><td>BB type
BB type</td><td>
<table>
<tr><th></th><th>0</th><th>1</th><th>2</th></tr>
<tr><td>type</td><td>A</td><td>B</td><td>C</td></tr>
<tr><td>D0</td><td>L</td><td>H</td><td>L</td></tr>
<tr><td>D1</td><td>L</td><td>L</td><td>H</td></tr>
</table>
</td></tr>
<tr><td>⑤ X-Y Recorder</td><td>8E4*H</td><td>D0

D6

D7</td><td>X-Y Scan End
Marker on/off
X-Y start</td><td>end: H

ON: H

ON: H</td></tr>
<tr><td>⑥ A/D status Timmer Output</td><td>8E5*H</td><td>D0

D7</td><td>Timer output
A/D status</td><td></td></tr>
</table>

Table 5-5 Output data (Cont'd)

Item	Address	Data Bus	Contents of data	Remarks
⑦ Y2 Range Select	8F6*H	D0 D1 D2	Y2 Range Y2 Range Y2 Range	RANGE 0 1 2 3 4 5 6 7 L H L H L H L H L L H H L L H H L L L L H H H H
⑧ Noise Suppress	8F7*H	D0 D1	Noise Suppress Noise Suppress	0 Normal / 1 AVG(STO) / 2 Y-STO / 3 AVG-STO L H L H L L H H
⑨ Recorder Control	8F8*H	D0 D1 D2	Recorder Recorder Recorder	Y1; ON; H, OFF; L Y2; ON; H, OFF; L M ; ON; H, OFF; L
⑩ A/D CONV. Input Select	8F9*H	D0 D1 D2 D7	A/D Input Select A/D Input Select A/D Input Select A/D Run/Hold	0 1 IF level 2 BB level 3 4 Y1 Range 5 Y2 Range 6 Y1 P-P 7 Y2 P-P L H L H L H L H L L H H L L H H L L L L H H H H H: Run L: Hold
⑪ Detector Reset	8FA*H	D0 D1 D2 D3	Y1R-Reset Y2R-Reset Y1P-P-Reset Y2P-P-Reset	H: Reset L: Set H: Reset L: Set H: Reset L: Set H: Reset L: Set
⑫ Hor Select/ Y1, Y2 ON-OFF	8FB*H	D0 D1 D4 D5 D7	Spectrum BB SWEEP Y1 ON/$\overline{\text{OFF}}$ Y2 ON/$\overline{\text{OFF}}$ CAL ON/$\overline{\text{OFF}}$	SPECTRUM on: H BB SWEEP on: H Y1 ON: H Y2 ON: H CAL ON: H

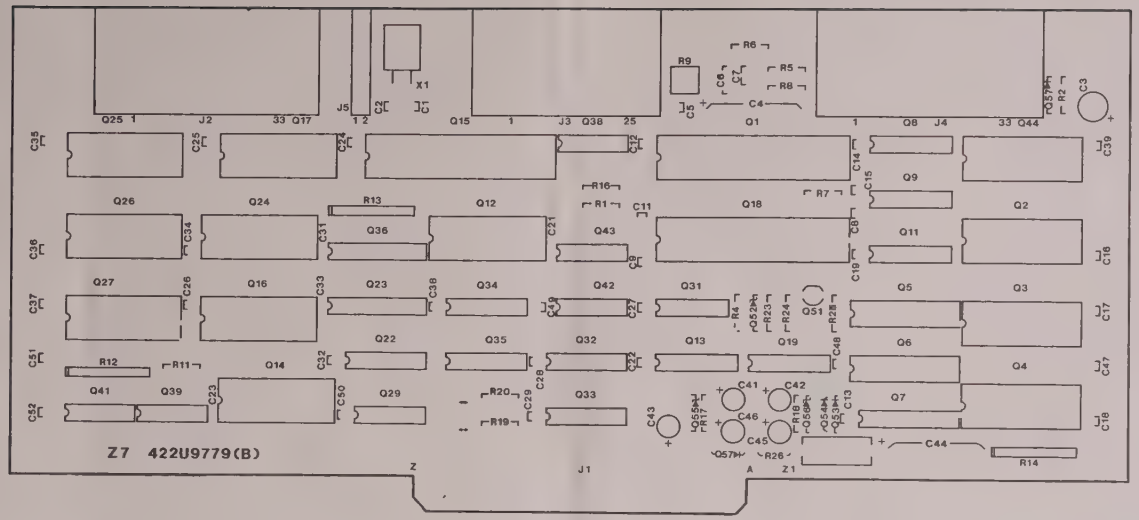
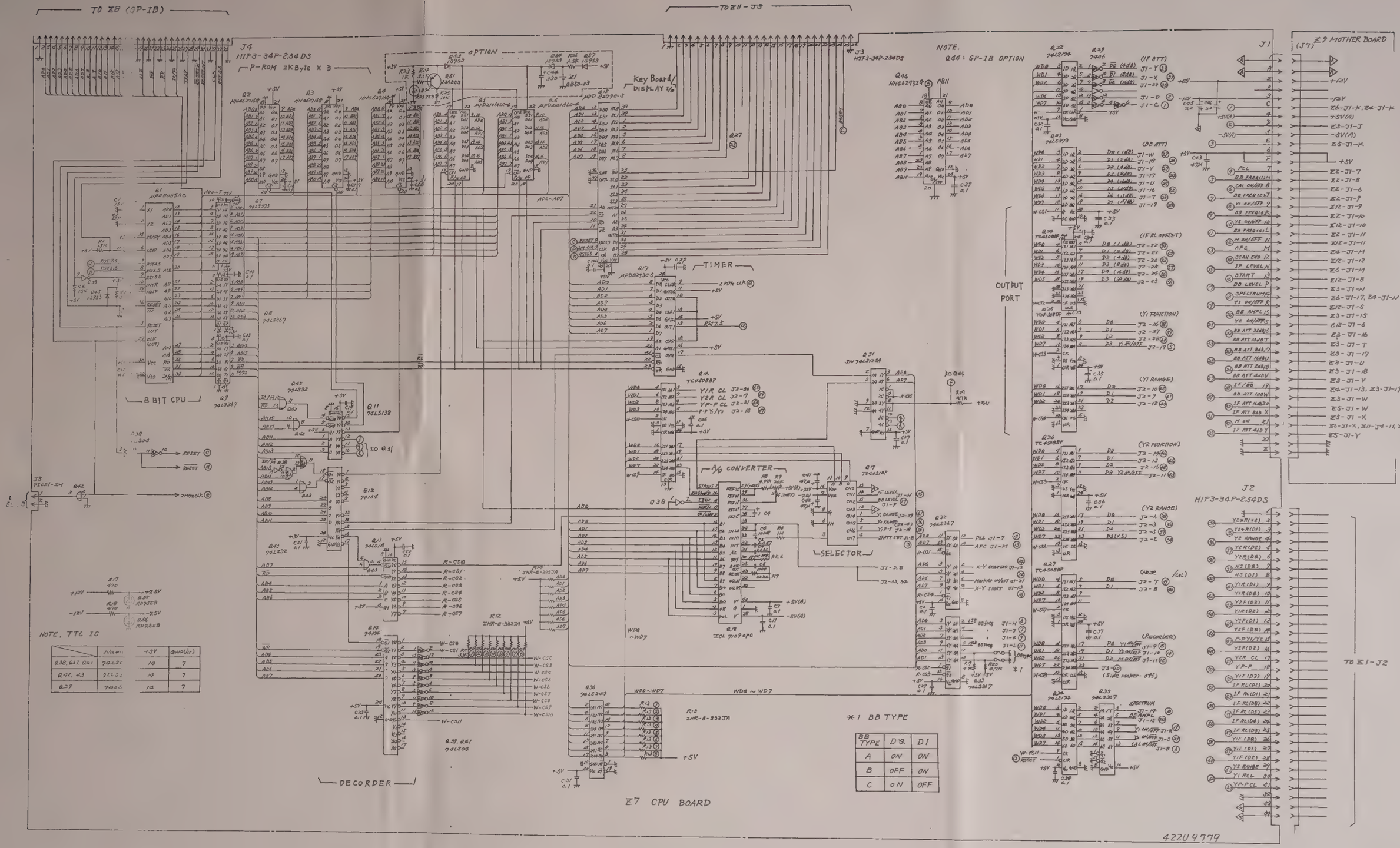


Fig. 5-43 Component Location of Z7



COMPONENT LIST: Table 6-18

Fig. 5-44 CIRCUIT DIAGRAM OF Z7 CPU (RECEIVER)

(41W1279)

5.3.10 Z9 MOTHER BOARD

(1) Circuit Description

This is the wiring circuit that connects the various PC boards.

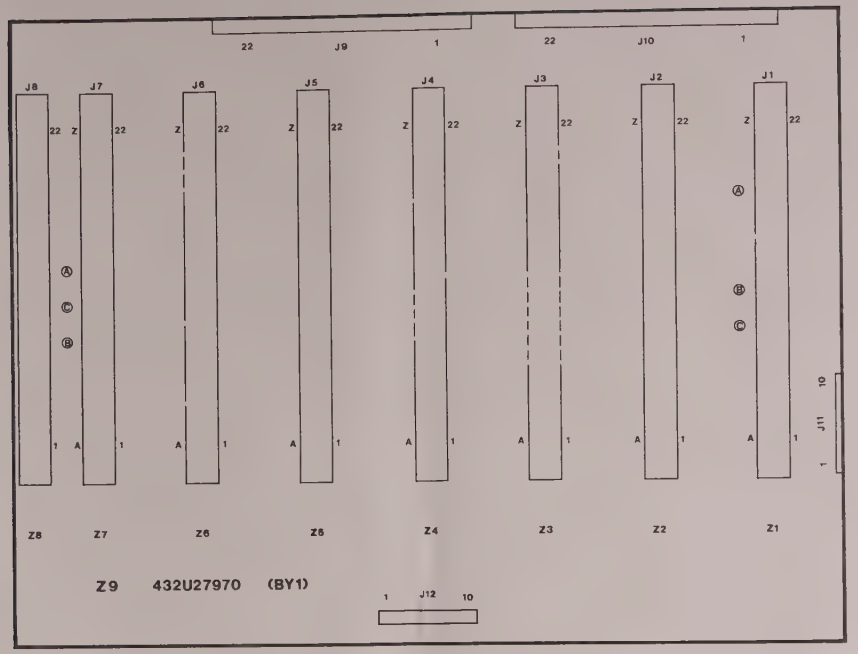
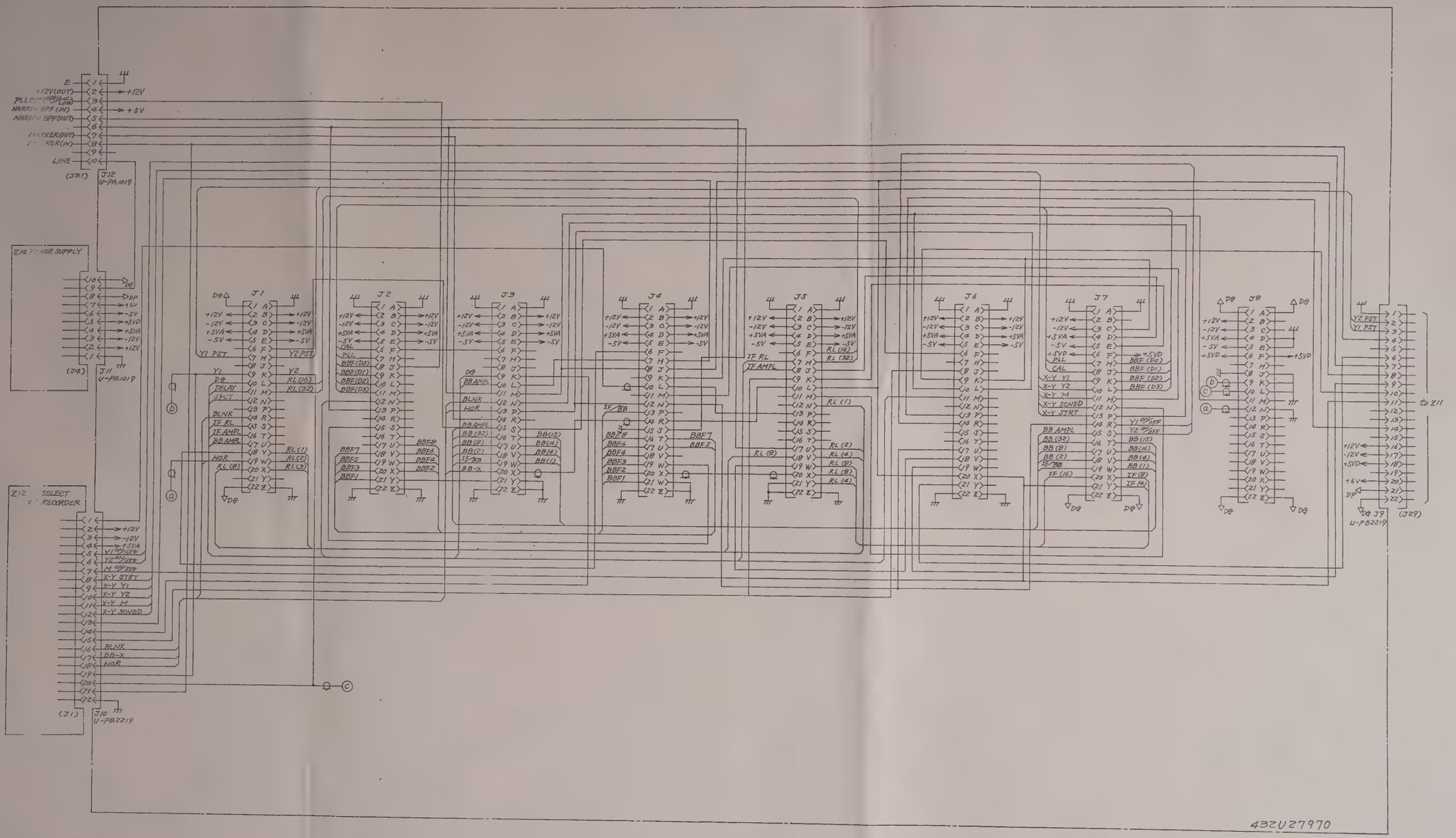


Fig. 5-45 Component Location of Z9



COMPONENT LIST: Table 6-19

Fig. 5-46 CIRCUIT DIAGRAM OF Z9 MOTHER BOARD (RECEIVER)

(41W1301)

5.3.11 Z10 OPERATING/LED BOARD

(1) Circuit description

This circuit consists of the operating circuit and LED display circuit.

Function settings are read by the keyboard interface (LSI) on Z7 CPU when the pushbutton switch (S1 to S21) is turned ON/OFF and are sent to the CPU.

IF BAND switching is accomplished by selecting 70 MHz: 0 V or 140 MHz: +5 V using the slide switch (S23).

This switching signal is used to switch the IF local oscillator and Z6 crystal oscillator.

Slide marker frequency is set by the variable resistor (R4).

Marker position is set by adding the voltage that is set by the variable resistor (R1) to the offset voltage of the marker base line.

Y1, Y2 position is set by adding the voltage that is set by the variable resistor (R5, R6) to each of Y1 and Y2 RANGE circuits of Z1.

LED DISPLAY: IF LEVEL (Q7 through Q10), BB LEVEL/FM DEVIATION (Q11 through Q14), Y1 RANGE/Y1 P-P (Q1 through Q3), and Y2 RANGE/Y2 P-P (Q4 through Q6) are displayed by time-sharing method. There are driven by the common data line (B00 through B06), the decimal point line (J1-53), and scan line (S00 through S14) sent from Z11.

SLIDE MARKER is displayed (Q15 through Q18) by time-sharing method for the value counted by the Z11 counter using the data line (ⓗ - ⓟ) and scan line (ⓡ - ⓤ).

FUNCTION switch LED is turned on by the data line (A01 through A06) and scan line (S00 through S14) sent from Z11.

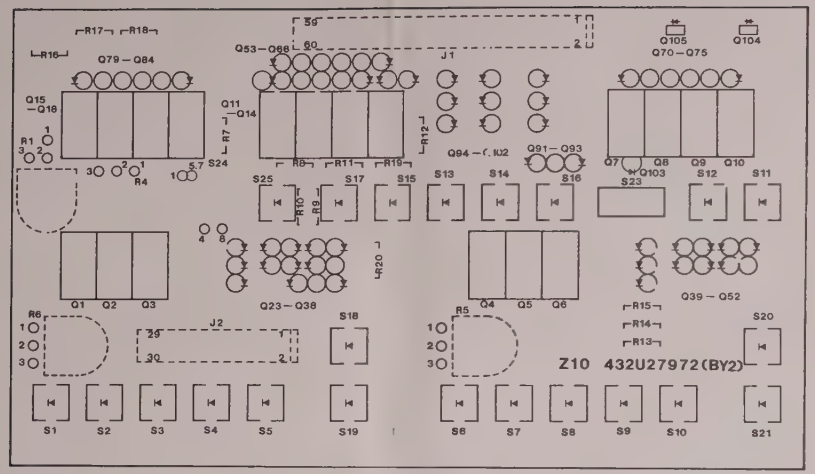


Fig. 5-47 Component Location of Z10

5.3.12 Z11 LED DRIVER

(1) Circuit description

This circuit consists of the circuit for driving the LED display data from the Z7 CPU, the circuit for reading the information of Z10 pushbutton switch and sending them to the programable keyboard/display interface (LSI) of Z7 CPU, and the slide marker counter.

Data line (OUT A0 - A2) are the data lines which are used to light LEDs of the function keys (Z10, S1 through S21) and which are decoded by the decoder (Q2) and sent to Z10.

Data line (OUT A3) is used to light the decimal point of the LED display, which is sent to Z10 via the driver (Q13).

Data lines (OUT B0 through B3) are used to send data to the LED display (Z10-Q1 through Q14). The data are converted by the BCD-SEVEN SEGMENT converter (Q15) and sent to Z10 via the driver (Q16).

SCAN line 1 (SL0 through SL3) is a digit signal for lighting the LED time-sharing method, which is decoded by the decoder (Q8) and sent to Z10 via the driver (Q9 through Q12).

SCAN LINE 2 (SL0 - SL2) is a digit signal for reading the ON/OFF data of the function keys (Z10, S1 through S21), which is decoded into the SCAN LINE (SL00 through SL07) by the decoder (Q1) and sent to Z10.

Return line (RL1 through RL5) is the return line for reading the ON/OFF data of the function keys (Z10, S1 through S21) and sent to Z7 CPU.

SLIDE MARKER: The frequencies of the SLIDE

MARKER are counted by the frequency counter (Q28). Its data are converted by the BCD-SEVEN SEGMENT converter (Q29) and sent to Z10 via the driver (Q30). At the same time the digit signal (Q28, T2 through T5) is also sent to Z10 via the driver (Q32).

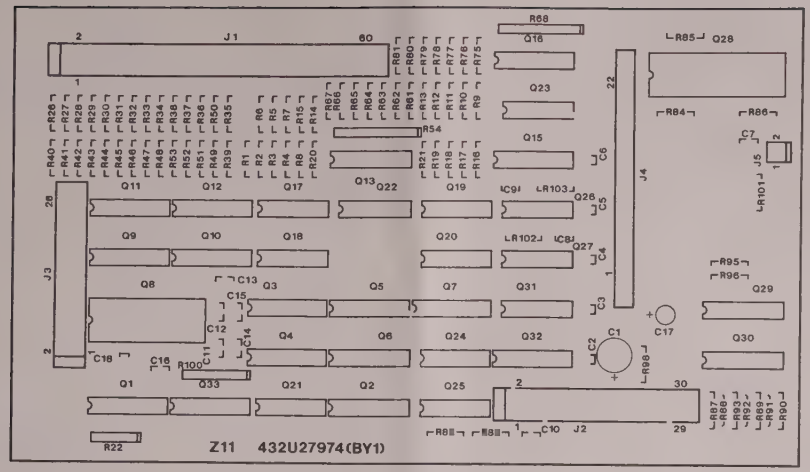
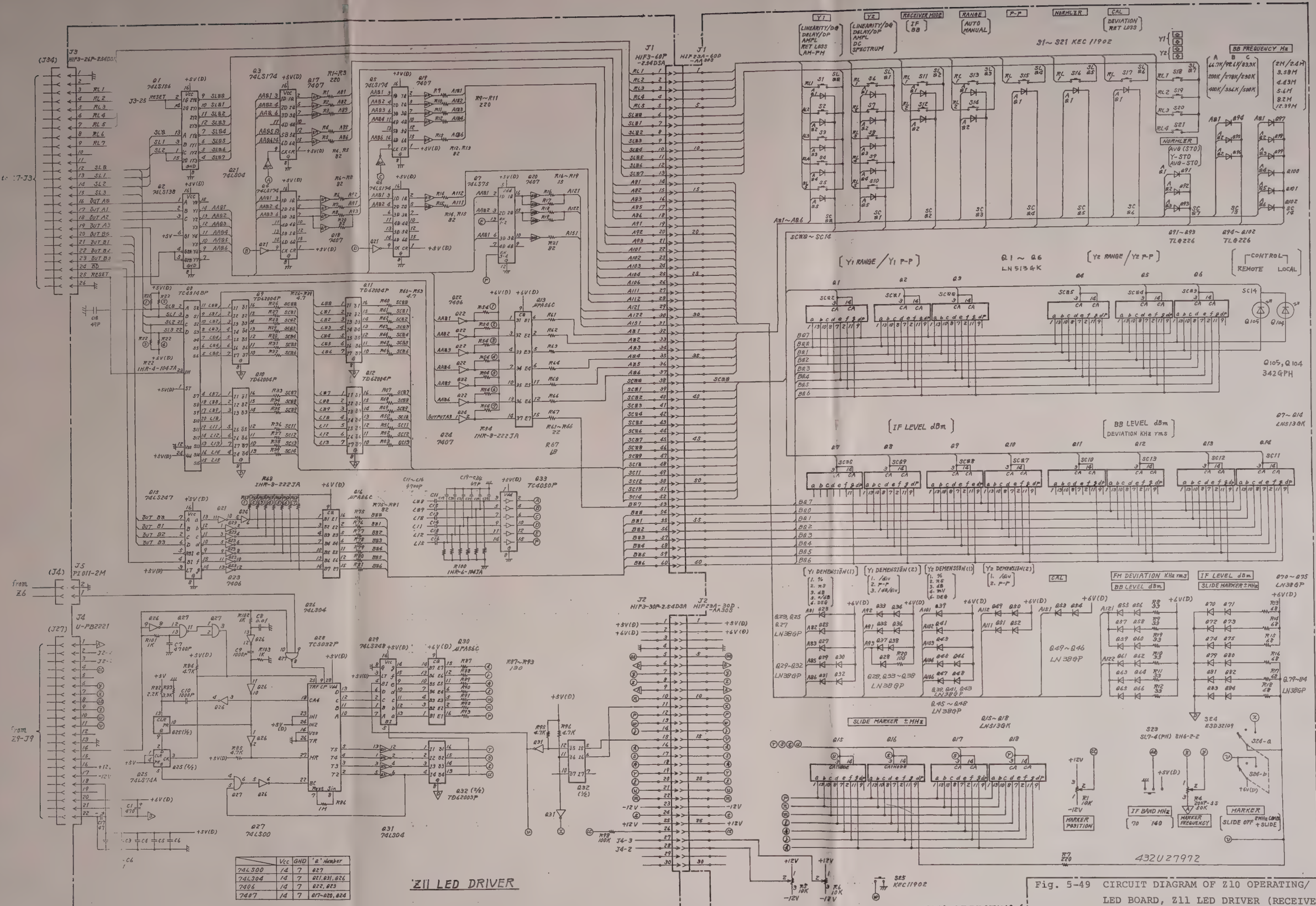


Fig. 5-48 Component Location of Z11


Z11 LED DRIVER
Z10 OPERATING/ LED BOARD
432U27974
432U27972
Y1 RANGE / Y1 P-P
Y2 RANGE / Y2 P-P
CONTROL
REMOTE LOCAL
IF LEVEL dBm
BB LEVEL dBm
DEVIATION KHz rms
FM DEVIATION KHz rms
SLIDE MARKER ±MHz
MARKER
MARKER FREQUENCY
MARKER POSITION
MARKER CHECK
Y1 POSITION
Y2 POSITION
CAL
NORMLZR
RECEIVER MODE
RANGE
P-P
BB FREQUENCY Hz
S1~S21 KEC 11902
Q1 ~ Q6 LN513GK
Q7~Q14 LN5138K
Q15~Q18 LN5139K
Q19~Q24 LN38GP
Q25~Q28 LN38GP
Q29~Q32 LN38GP
Q33~Q38 LN38GP
Q39~Q46 LN38GP
Q47~Q54 LN38GP
Q55~Q62 LN38GP
Q63~Q70 LN38GP
Q71~Q75 LN38GP
Q91~Q93 TLR226
Q94~Q102 TLR226
Q105, Q104 342GPH
S23 SL7-4(PH) BH6-2-2
S24 ESD32109
S25 KEC11902
J1 HIF3-60P-2.54DSA
J1 HIF3B4-60D-AA308
J2 HIF3-30P-2.54DSA
J2 HIF3A-30D-AA308
J3 HIF3-24P-2.54DSA
J4 U-PB2221
J5 PI011-2M
(J34)
(J4)
(J27)
from Z6
from Z9-J9
J3-25
Z7-J3
Q1 74LS154
Q2 74LS138
Q3 74LS174
Q4 74LS174
Q5 74LS174
Q6 74LS174
Q7 74LS75
Q8 TC5414BP
Q9 TD62004P
Q10 TD62004P
Q11 TD62004P
Q12 TD62004P
Q13 μPA56C
Q14 μPA56C
Q15 74LS247
Q16 μPA56C
Q17 7407
Q18 7407
Q19 7407
Q20 7407
Q21 74LS04
Q22 7406
Q23 7406
Q24 7407
Q25 74LS74A
Q26 TC5032P
Q27 74LS00
Q28 TC5032P
Q29 74LS248
Q30 μPA56C
Q31 74LS04
Q32 TD62003P
Q33 TC4050P
R1~R3 220
R4, R5 82
R6~R8 82
R9~R11 220
R12, R13 82
R14, R15 82
R16~R19 15
R20 82
R21 82
R22 IHR-4-104JA
R24~R39 4.7
R40~R53 4.7
R54 IHR-8-222JA
R61~R66 22
R67 4.7
R68 IHR-8-222JA
R75~R81 82
R82~R86 1M
R87~R93 130
R94 4.7K
R95 4.7K
R96 4.7K
R97 100K
R98 100K
R99 10K
R100 IHR-6-104JA
R101 1K
R102 1K
R103 1K
C1 470
C2 470
C3 47
C4 47
C5 47
C6 47
C7 4700P
C8 4PP
C9 1000P
C10 1000P
C11~C16 4700P
C17~C22 47P
Y1
Y2
Y1 LINEARITY/DG DELAY/DP AMPL RET LOSS AM-PM
Y2 LINEARITY/DG DELAY/DP AMPL DC SPECTRUM
IF BB
AUTO MANUAL
DEVIATION RET LOSS
AVG (STO) Y-STO AVG-STO
2M/2.4M 3.58M 4.43M 5.6M 8.2M 12.39M
400K/334K/300K
200K/170K/150K
44.7K/37.2K/33.3K
Y1 DEMENSION(1) 1. % 2. m 3. dB 4. V/dB 5. DEG
Y1 DEMENSION(2) 1. /div 2. P-P 3. /dB/div
Y2 DEMENSION(1) 1. % 2. nS 3. dB 4. mV 5. DEG
Y2 DEMENSION(2) 1. /div 2. P-P
SC11~SC14
SC81~SC87
SC88~SC89
AB1~AB6
BB0~BB6
A91~A93
A94~A102
A101~A106
A111~A112
A121~A122
A131~A151
A161~A171
A181~A182
A191~A193
A201~A206
A211~A212
A221~A222
A231~A251
A261~A271
A281~A282
A291~A293
A301~A306
A311~A312
A321~A322
A331~A351
A361~A371
A381~A382
A391~A393
A401~A406
A411~A412
A421~A422
A431~A451
A461~A471
A481~A482
A491~A493
A501~A506
A511~A512
A521~A522
A531~A551
A561~A571
A581~A582
A591~A593

5.3.13 Z12 X SELECT/X-Y RECORDER

(1) Circuit description

This circuit consists of a circuit for controlling the Y signal to be sent to the CRT, a circuit for adjusting the phase of X signal, and the X-Y recorder circuit.

Y signal of CRT: Y1 signal (J1 - 20), Y2 signal (J1 - 19), and marker signal (J1 - 21) are selected on the time sharing basis and are sent to Z13 CRT.

There are two time sharing modes of Y signal, chopping mode and alternate mode.

When the chopping mode is used, the 60 kHz signal of the chopping oscillator (Q6) is divided by the 1/3 divider (Q5) and the divided signals are used to control the selector (Q15).

When the alternate mode is used, the blanking signal is used for switching instead of the output signal of the chopping oscillator.

HOR phase adjust is a 360 degree continuous adjuster. It is used to generate four signals which are shifted 90 degrees to one another using the phase shifter (Q1 through Q3), vector synthesis using the potentiometer (R117), and continuously vary them 360 degrees.

SCALE INTEN: The oscillator (Q12) starts oscillating when the SCALE INTEN is turned ON. Then, the oscillator output is send to the CRT instead of the Y signal uniformly illuminate the screen.

X-Y recorder circuit is used to convert the fluctuating speed of Y signal to approximately 1/1000 or 1/2000 using the sampling method, thereby

enabling the image to be measured that is displayed on the CRT to be recorded by the X-Y recorder.

The output of the saw-tooth wave generator (Q29) with approximately 20 sec (or 40 sec) repetitive cycle and the HOR signal are compared (Q37), the sampling pulse (Q38) is generated at their cross point, with which the sample hold circuit is driven.

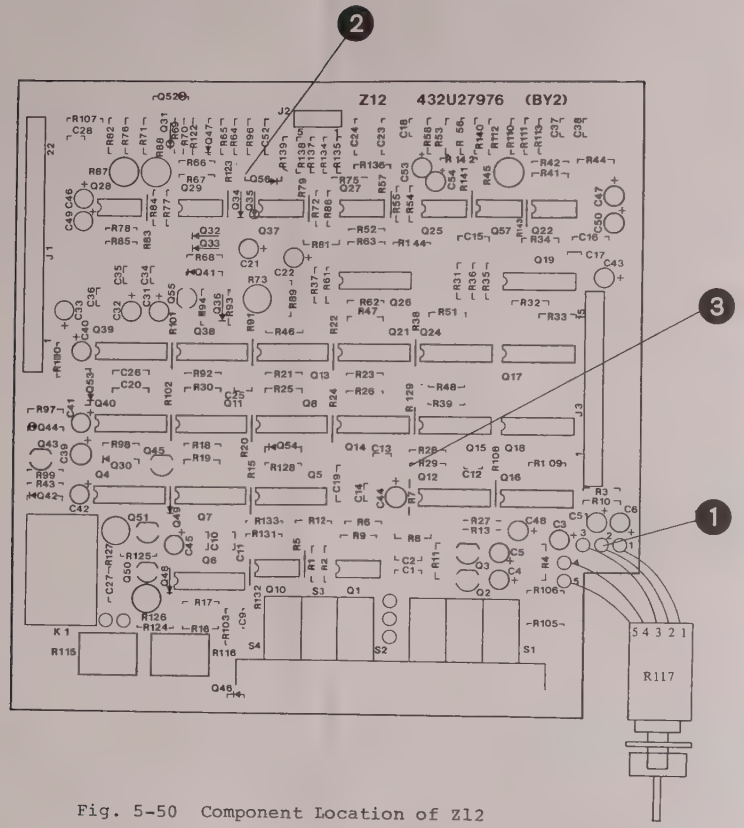


Fig. 5-50 Component Location of Z12

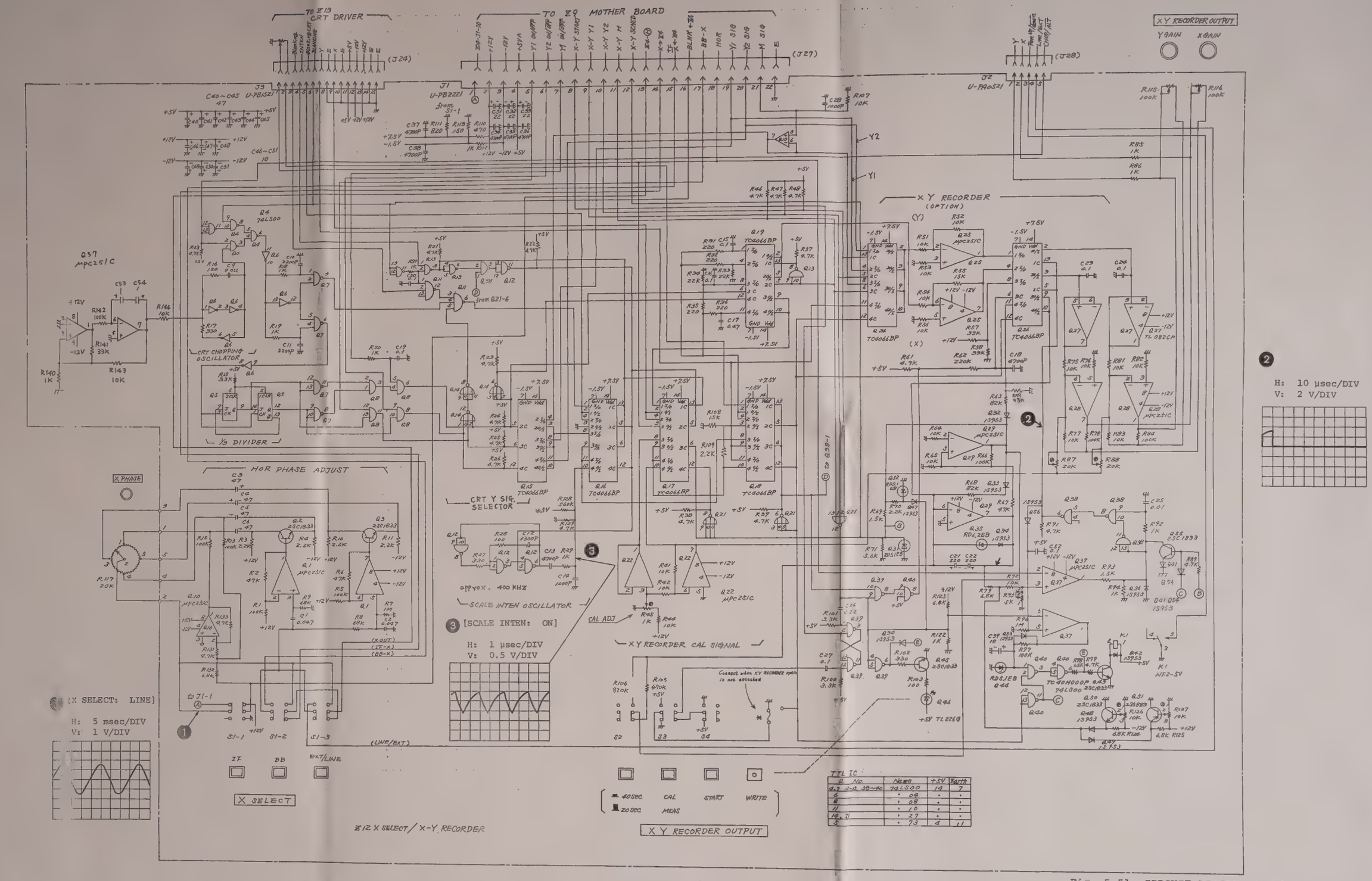


Fig. 5-51 CIRCUIT DIAGRAM OF Z12 X SELECT/X-Y RECORDER (RECEIVER)

(41W1280)

COMPONENT LIST: Table 6-22

5.3.14 Z13 CRT DRIVER

(1) Circuit description

This circuit consists of a vertical AMP, horizontal AMP, high voltage generator circuit, and blanking circuit.

VERTICAL AMP (Q6 through Q11) is a dc amplifier with a voltage gain of approximately 36 dB.

HOR AMP (Q13 through Q18) is a dc amplifier with a voltage gain of approximately 45 dB.

High voltage generator circuit generates high voltages for driving each electrode of the CRT. ac current of approximately 20 kHz is generated by the DC-AC converter (Q28, Q29), which is converted to high voltage by the high voltage transformer (T1).

BLANKING circuit is the circuit for erasing the retrace of the image to be measured that is displayed on the CRT. The INTENSITY circuit (Q22 through Q24) is turned ON by the blanking signal (J1-5) to lower the first grid voltage of the CRT for erasing the bright lines.

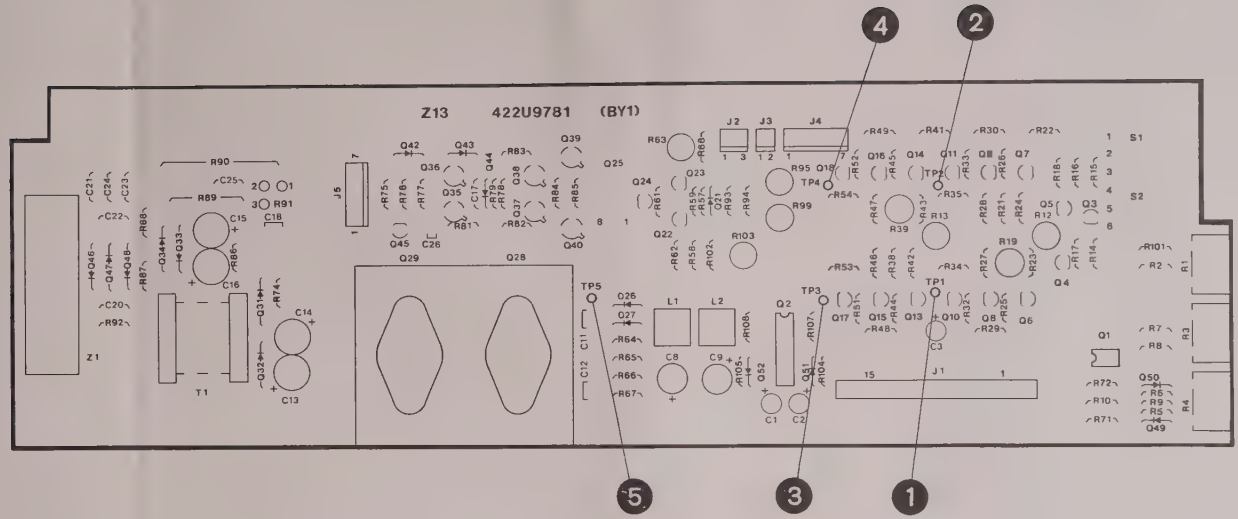


Fig. 5-52 Component Location of Z13

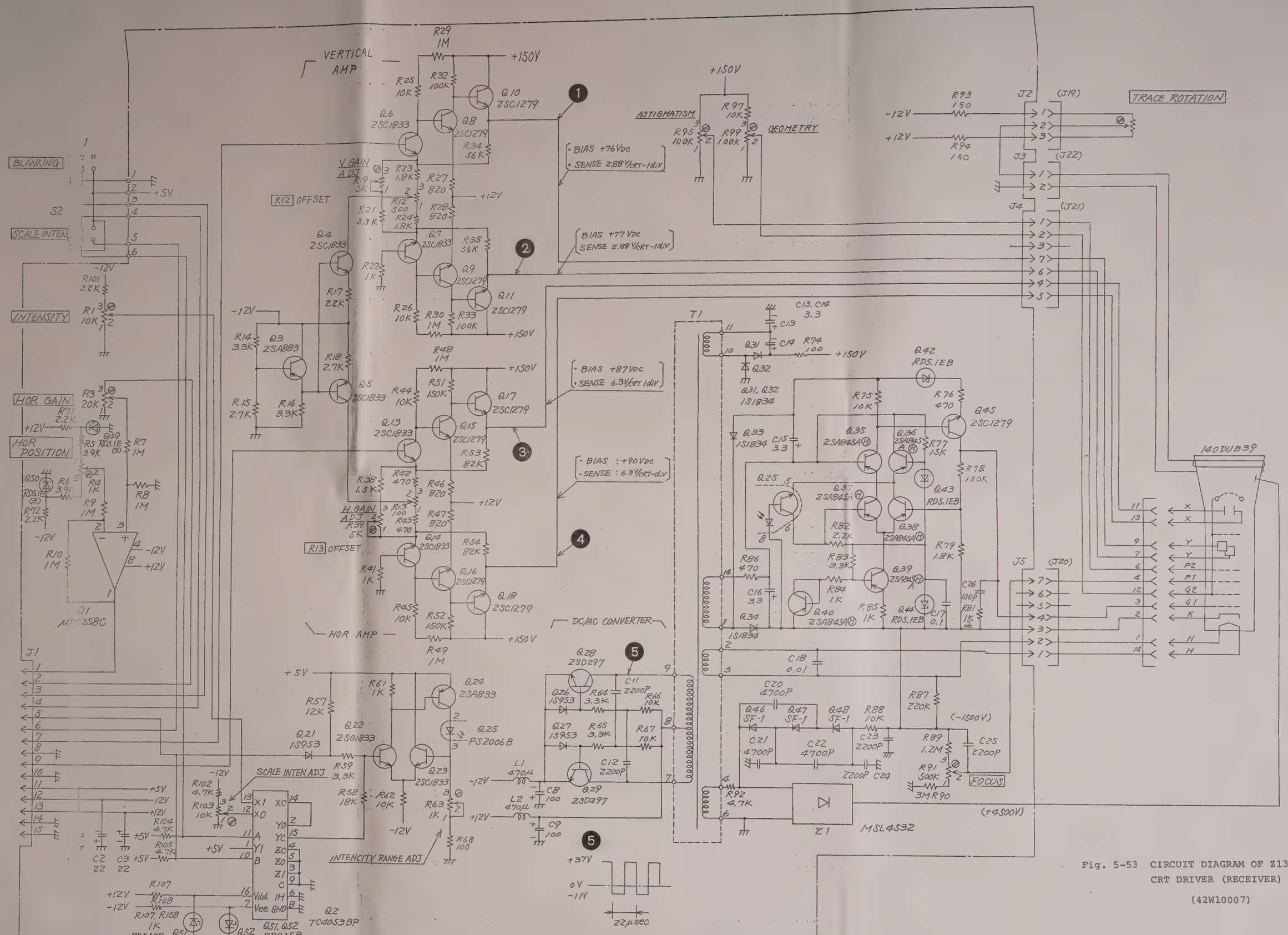


Fig. 5-53 CIRCUIT DIAGRAM OF Z13 CRT DRIVER (RECEIVER)

(42W10007)

COMPONENT LIST: Table 6-23

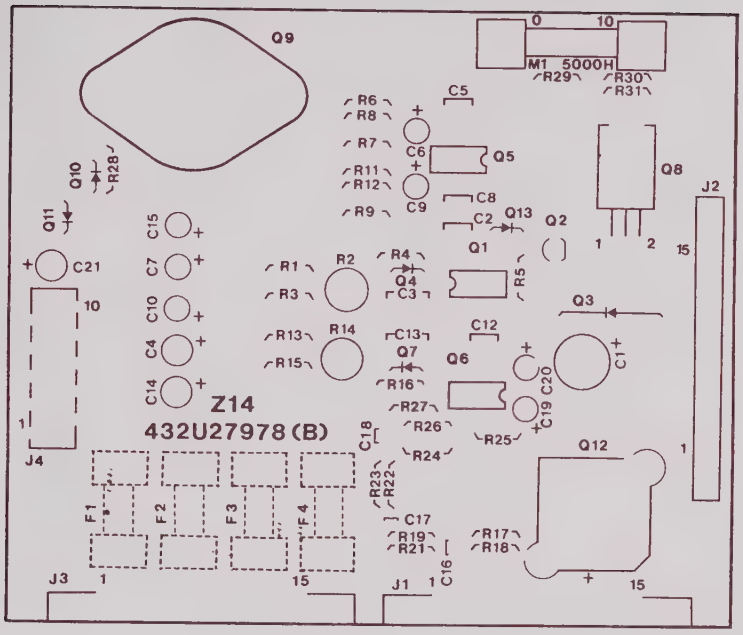


Fig. 5-54 Component Location of Z14

5.3.15 Z14 POWER SUPPLY

(1) Circuit description

This circuit consists of five dc regulated power supply circuits of ±5 V, ±12 V, and +5 V (A). This circuit is also used to send the line signal to the Z12 X selector via the LPF (Q6).

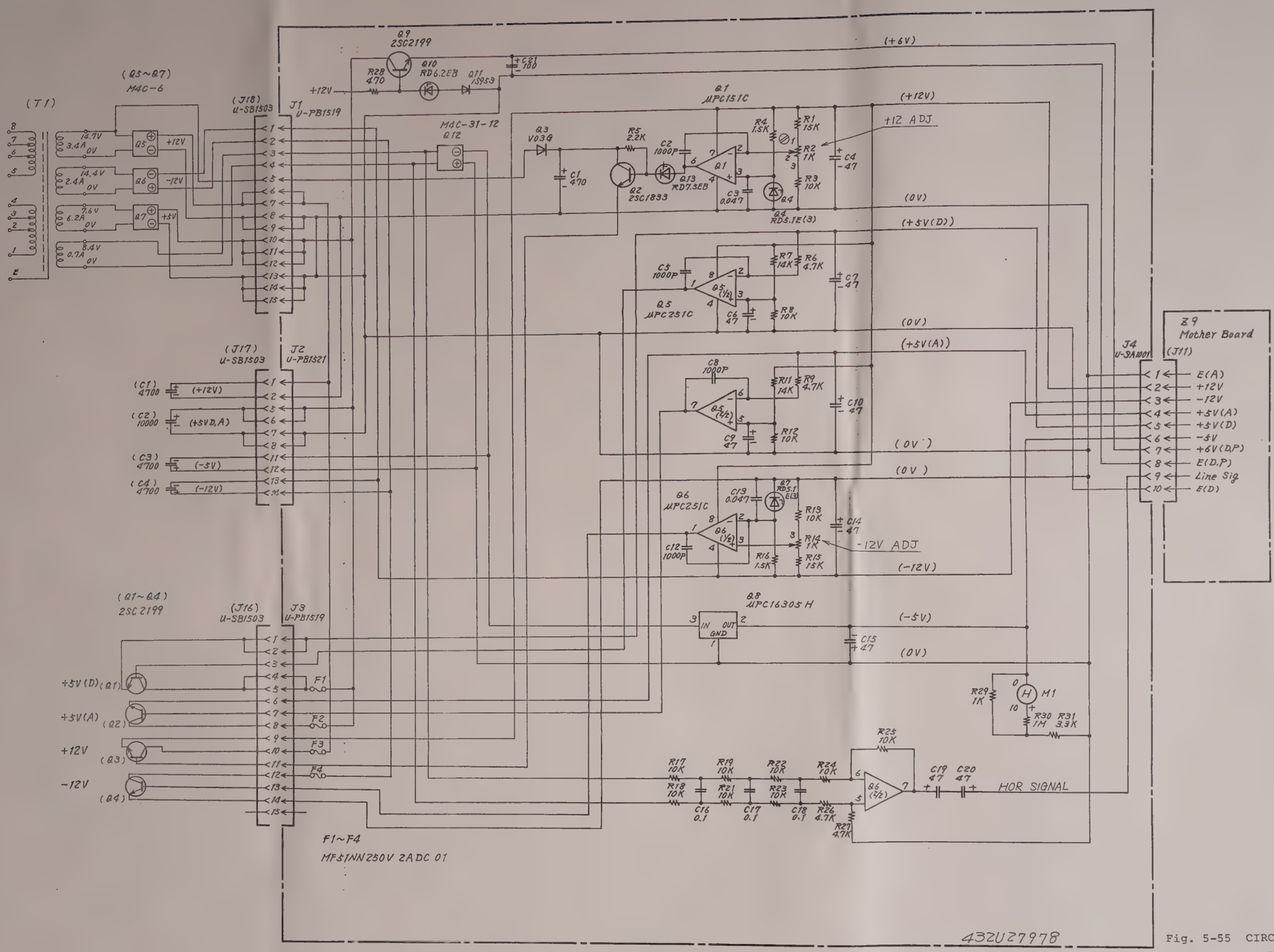


Fig. 5-55 CIRCUIT DIAGRAM OF Z14 POWER SUPPLY (RECEIVER)

(42W9974)

COMPONENT LIST: Table 6-24

5.3.16 Z15 AVG

This circuit is used to normalize the image to be measured in conjunction with the Z1 RANGING AND AVG circuit. This circuit consists of the adder (Q1 through Q3), memory (Q6, Q7), D/A converter (Q14 through Q18, Q23 through Q27), and address counter (Q29).

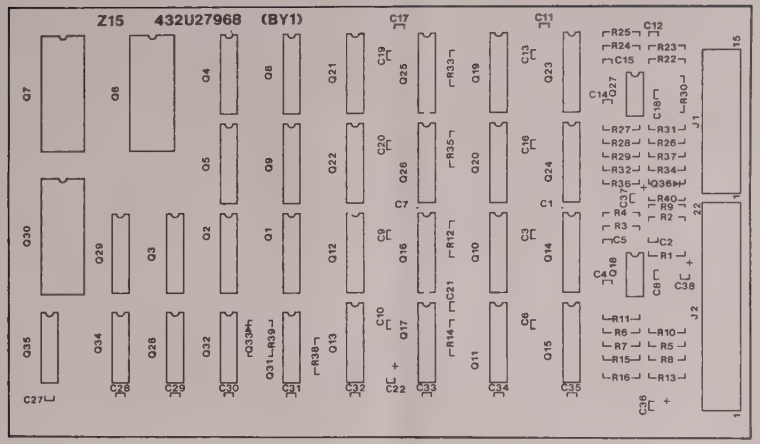
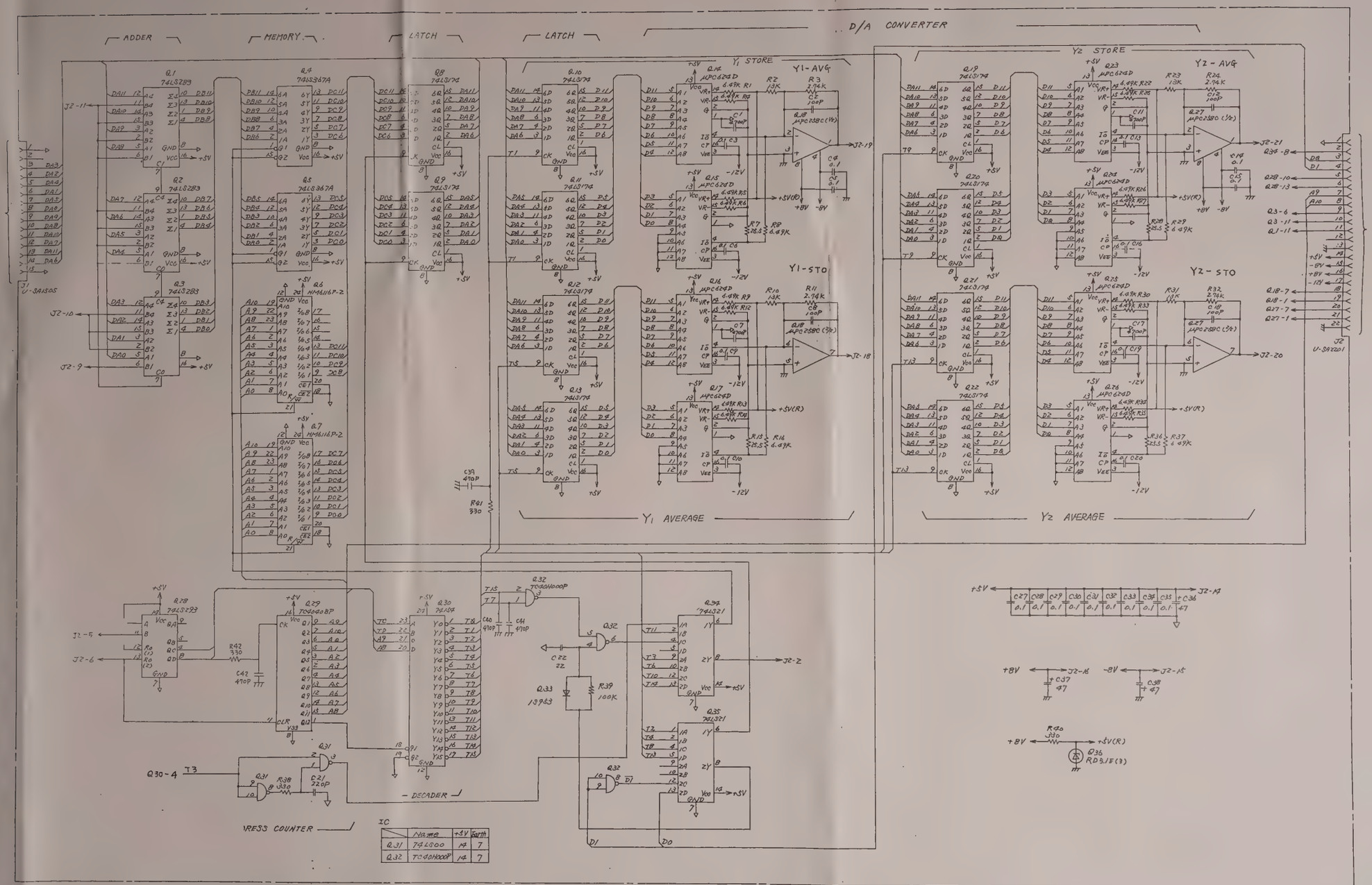


Fig. 5-56 Component Location of Z15



COMPONENT LIST: Table 6-25

Fig. 5-57 CIRCUIT DIAGRAM OF Z15 AVG (RECEIVER)

(41W1304)

5.3.17 Z8 CP-IB/Z18 CONNECTOR BOARD (OPTION)

(1) Circuit description

This circuit transmits and receives the information to and from GPIB interface bus (IEEE Std 488-1978).

This circuit is controlled by Z7 CPU.

This circuit consists of GPIB Interface Controller (Q13), RAM (Q6, Q7, Q52), Decorder and Buffer, and is connected to 8085A CPU (Z7) through J2.

CPU address allocations are shown in Table 5-6.

Table 5-6 List of CPU address allocations

Item	Circuit Reference	State			Address bit															Address
		IO/$\overline{M}$	$\overline{RD}$	$\overline{WR}$	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0	
1. Data Memory																					
① RAM No.1 2k Byte	Q6	0	-	-	0	1	0	0	0												4000H ~ 47FFH
② RAM No.2 2k Byte	Q7	0	-	-	0	1	0	0	1												4800H ~ 4FFFH
③ RAM No.3 2k Byte	Q52	0	-	-	0	1	0	1	0												5000H ~ 57FFH
2. I/O PORT																					
① 8291A Controller	Q13	0	-	-	0	1	1	1	1	0	1	0	0	0							7A0*H
② GP-IB Address	Q16	0	0	-	0	1	1	1	1	0	1	0	0	1							7A4*H
③ AVG-M L Byte	Q18	0	0	-	0	1	1	1	1	0	1	0	1	0							7A8*H
④ AVG-M H Byte	Q17	0	0	-	0	1	1	1	1	0	1	0	1	1							7AC*H
⑤ AVG-M CLOCK	Q12	0	-	0	0	1	1	1	1	0	1	1	0	1							7B4*H

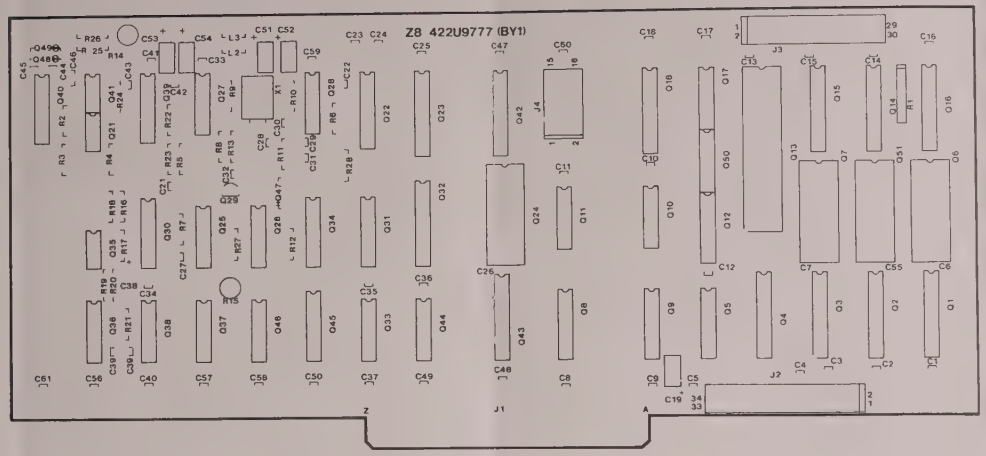


Fig. 5-58 Component Location of Z8

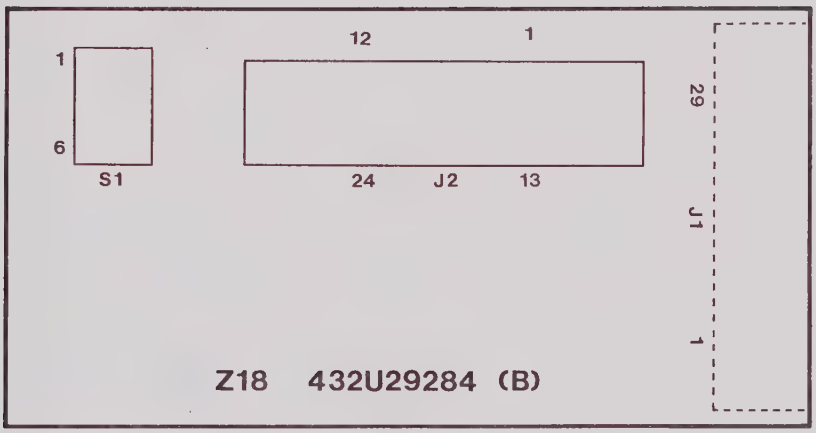


Fig. 5-59 Component Location of Z18

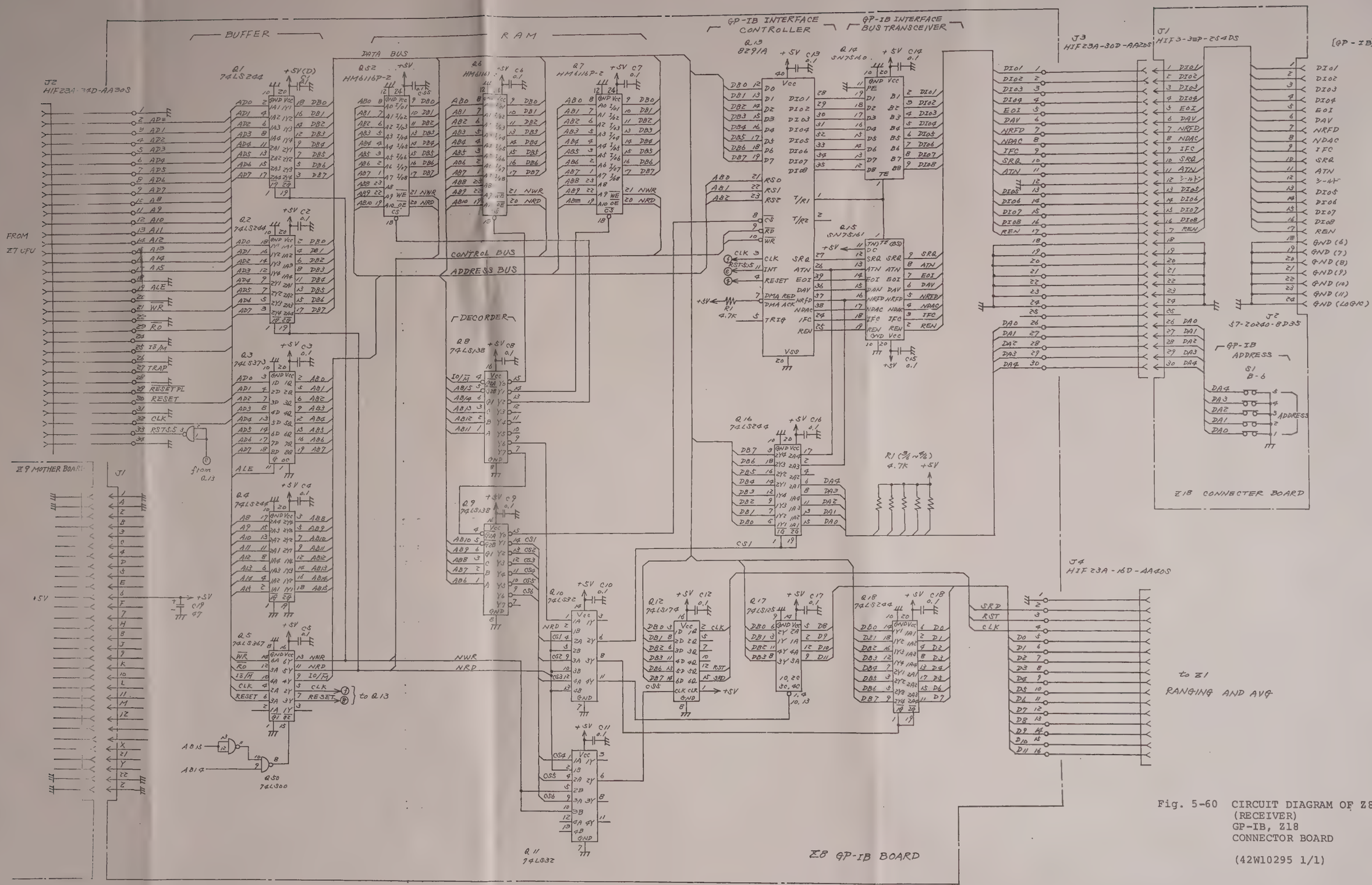


Fig. 5-60 CIRCUIT DIAGRAM OF Z8 (RECEIVER) GP-IB, Z18 CONNECTOR BOARD

(42W10295 1/1)

COMPONENT LIST: Table 6-26, 6-27

SECTION 6

REPLACEABLE PARTS

6.1 INTRODUCTION

This section contains information relative to ordering replacement components. The following table shows circuit references (hereinafter CKT REF) and abbreviations used for components given in the component list. In the component list, the quantity of each component is one so far as no quantitative description is given in the "NOTE" column.

(1) Circuit reference

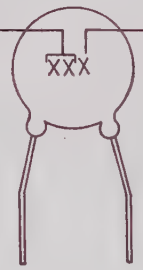
AT: Attenuator	K: Relay	Q: Transistor, Diode, Rectifier, IC	T: Transformer
C: Capacitor	L: Coil	R: Resistor	V: Neon lamp, Vaccumtube
F: Fuse	M: Meter, timer	S: Switch	Z: Unit
J: Jack, plug, connector	P: Lamp		

(2) Abbreviations

A	: amperes	J-FET	: junction FET	PNP	: positive-negative-positive
Att. R var	: attenuator variable using film resistive elements	k	: kilo ($\times 10^{3}$)	p-p, pp	: peak to peak value
BL	: boundary layer	LED	: light emitting diode	RFC	: RF choke
				R-lamp	: resistor lamp
Cer	: ceramic	M	: mega ($\times 10^{6}$)	rms	: effective value (root means square)
CF	: carbon film	m	: milli ($\times 10^{-3}$)		
Comp	: composition	MF	: metallized film	SBD	: shottky barrier diode
CRT	: cathode-ray tube	MOS-FET	: metal oxide semi-conductor FET	SCR	: sillicon controlled rectifier
		M paper	: metallized paper	Si	: sillicon
Di	: diode	M plast	: metallized plastic film	SRD	: step recovery diode
DIL type	: dual-in line type	Multi	: multiplying		
Elect	: electrolyte aluminum			Tant	: tantalum
		N ch	: N channel	Tr	: transistor
F	: farad	non-lin	: non-linear taper	Trans	: transformer
FET	: field effect transistor	Non-pol	: non-polarity		
		NPN	: negative-positive-negative	μ	: micro ($\times 10^{-6}$)
G	: ground			V	: volt
Ge	: germanium	Ω	: ohms	Var	: variable
H	: henry				
Hz	: hertz	p	: pico ($\times 10^{-12}$)	WW	: wire wound
		Plast	: plastic film		
IC	: integrated circuit	PMTR	: potentiometer	XTAL	: crystal
IEC	: Applicable to IEC Safety Standard				

6.2 METHOD OF READING CAPACITORS/RESISTORS

6.2.1 Capacitor Identification



Value in Picofarads (pF)

Number of zero's following the value

EXAMPLES: 103 = 10,000pF = 10^{-8}F or 0.01μF

302 = 3,000pF = $3x10^{-9}$F or 0.003μF

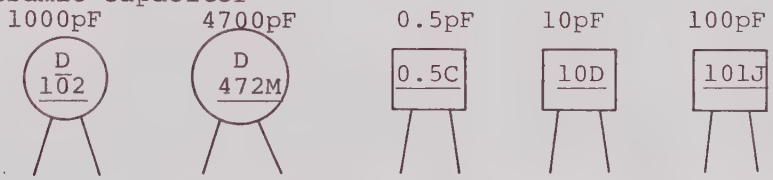
676 = 67,000,000pF = $67x10^{-6}$F or 67μF

(a) Ceramic capacitor, polyester capacitor

Indication	0.5	1	10	101	102	103	104
Capacity	0.5pF	1pF	10pF	100pF	1000pF	0.01μF	0.1μF

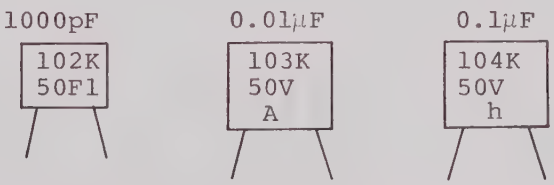
Example:

Ceramic Capacitor



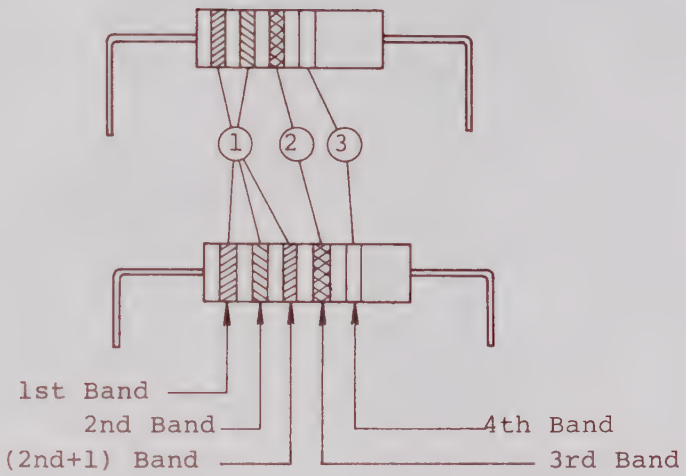
Capacity values are always underlined.

Polyester Capacitor



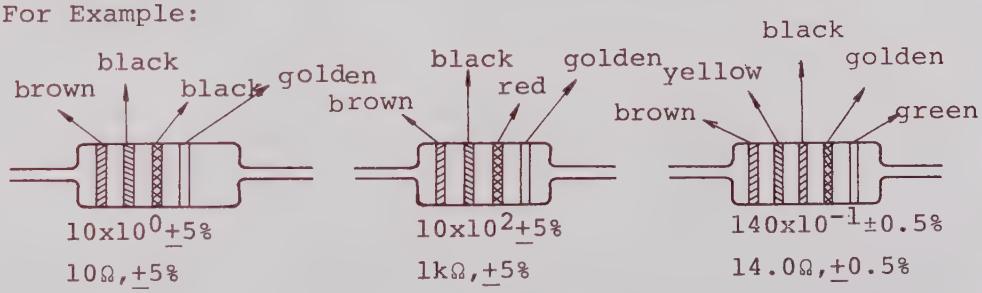
(b) Tantalum capacitor. Metallized capacitor and Electrolytic capacitor

Indication	OR47	010	100	101
Capacity	0.47μF	1μF	10μF	100μF



	①		②	③
COLOR	Figure		Multiplier	Tolerance
	1st	2nd	3rd	4th
Black	0	0	$x10^0$	-
Brown	1	1	$x10^1$	-
Red	2	2	$x10^2$	-
Orange	3	3	$x10^3$	-
Yellow	4	4	$x10^4$	-
Green	5	5	$x10^5$	±0.5%
Blue	6	6	$x10^6$	-
Purple	7	7	$x10^7$	-
Grey	8	8	$x10^8$	-
White	9	9	$x10^9$	-
Gold	-	-	$x10^{-1}$	±5%
Silver	-	-	$x10^{-2}$	±10%
-----	-	-		±20%

For Example:



6.3 ORDERING INFORMATION

Upon ordering components, please give the following descriptions by referring to the C.L. (Component List).

Item	Example
(1) Name of instrument	MICROWAVE SYSTEM ANALYZER ME453A/B/C ME538A/B/C
(2) Name of component	COMPONENT LIST OF COUNTER (Z2)
(3) CKT REF	C18
(4) Name of component	ECQ-M1H 104KZ Note: Part nem is given in parentheses ( ) in the C.L. (Component List). Components with asterisks* are those that require factory adjustment upon repairing. When ordering a component or components with asterisk, give full description of the component.
(5) Quantity	1
(6) Serial No. of instrument	Serial No. M31257

6.4 COMPONENT LIST

Table 6-1 COMPONENT LIST OF ME453A/B/C, ME538A/B/C TRANSMITTER

CKT REF	DESCRIPTION	RATING		NOTE
AT 1	Att,R,(44R59906C)	10dB × 7		
AT 2	Att,R,(44R59906A)	1dB × 10		
C 1	Elect,(CE62C1C103)	10000μF,+100/-10%, 16V		
C 2	Elect,(CE62C1V472)	4700μF,+50/-10%,35V		
C 3	Elect,(CE62C1V222)	2200μF,+50/-10%,35V		
C 4	Elect,(CE62C1C222)	2200μF,+50/-10%,16V		
C 5	Elect,(CE02W1V471)	470μF,±20%,35V		
C 6	Elect,(CE02W1V471)	470μF,±20%,35V		
F 1	Fuse,(MF51NN250V 2A AC05)	2A,250V		
F 2	Fuse,(MF51NN250V 2A AC05)	2A,250V		
J 1	Inlet,(8843-2SPFL4/364)			
J 2	Connector,(U-SB1503)	15 pins		
J 3	Connector,(U-SB1503)	15 pins		
J 4	Connector,(U-SA1003)	10 pins		
J 5	Plug,(BNC-P620)			
J 6	Plug,(BNC-P620)			
J 7	Plug,(BNC-P620)			
J 8	Plug,(BNC-P620)			
J 9	Plug,(BNC-P620)			
J 10	Panel jack,(SP-3CPJ) or (BNC-PJ608)			IF OUTPUT
J 11	Plug,(BNC-P620)			
J 12	Panel jack,(SP-3CPJ) or (BNC-PJ608)			AUT IF OUTPUT
J 13	Connector,(PI011-2F)			
J 14	Connector,(PI011-2F)			
J 15	Not assigned			
J 16	Connector,(PI011-2F)			
J 17	Connector,(PI011-2F)			
J 18	Connector,(PI011-2F)			
J 19	Connector,(PI011-2F)			
J 20	Connector,(PI011-2F)			
J 21	Connector,(PI011-2F)			
J 22	Connector,(PI011-2F)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-1 COMPONENT LIST OF ME453A/B/C, ME538A/B/C TRANSMITTER

CKT REF	DESCRIPTION	RATING		NOTE
J 23	Plug,(BNC-P1-NI)			
J 24	Not assigned			
J 25	Not assigned			
J 26	Plug,(27DP-P-1.5)			
J 27	Not assigned			
J 28	Plug,(27DP-P-1.5)			
J 29	Plug,(BNC-P620)			
J 30	Panel jack,(SP-3CPJ) or (BNC-PJ608)			CRYSTAL OUTPUT
J 31	Not assigned			
J 32	Receptacle,(SP-3CR) or (BNC-R601-NI)			SWEEP OUTPUT
J 33	Connector,(U-SB1503)	15 pins		
J 34	Connector,(U-SB1503)	15 pins		
J 35	Connector,(PI011-2F)			
J 36	Connector,(PI011-2F)			
J 37	Connector,(PI011-2F)			
J 38	Connector,(PI011-2F)			
J 39	Connector,(PI011-3F)			
J 40	Connector,(PI011-6F)			
J 41	Panel jack,(BNC-PJ1-NI)			EXT BB INPUT
J 42	Receptacle,(BNC-R-101 (NI))			EXT SWEEP INPUT
J 43	Receptacle,(BNC-R-101 (NI))			EXT SWEEP INPUT(REAR)
J 44	Connector,(U-SB2203)	22 pins		
J 45	Connector,(U-SB1003)	10 pins		
J 46	Connector,(U-SB1003)	10 pins		
J 47	Earth terminal,(34E772)			
Q 1	IC,(S1-3554M)	+5V		
Q 2	IC,(μPC1431H)	+12V		
R 1	Var,MF,(RG161N20SB 1kΩM)	1kΩ,1/2W		IF OUTPUT LEVEL
R 2	Not assigned			
R 3	Var,MF,(RG161N15SB 100kΩM)	100kΩ,1/2W		IF SLOPE ADJ

( ): Manufacturer's part number
* : Selected at factory

Table 6-1 COMPONENT LIST OF ME453A/B/C, ME538A/B/C TRANSMITTER

CKT REF	DESCRIPTION	RATING		NOTE
S 1	Power switch,(ESB9997S)			
S 2	Mini pushbutton, (44S7123)			
S 3	Mini pushbutton, (1F2UEE)			
S 4	Slide,(SL73-6.5H)			
T 1	Power trans,(44T64484)	86VA		
V 1	Neon lamp,(BNC-3RU-C)			
Z 1	IF OSCILLATOR & AMPLIFIER			44W73729
Z 2	COUNTER			44W73730
Z 3	SWEEP OSCILLATOR & BB AMPLIFIER			44W73731
Z 4	BB OSCILLATOR			44W73732
Z 5	CRYSTAL OSCILLATOR & BB SWEEPER			44W73733
Z 6	Not assigned			
Z 7	Not assigned			
Z 8	MOTHER BOARD			44W73734
Z 9	LED BOARD			44W73735
Z 10	FRONT BOARD			44W73736
Z 11	POWER SUPPLY			44W73737
Z 12	Not assigned			
Z 13	Noise filter,(ZMB2203-13)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-2 COMPONENT LIST OF IF OSCILLATOR & AMPLIFIER (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
AT 1	Att,(CAT-506)	6dB		
AT 2	Att,(CAT-506)	6dB		
AT 3	Att,(CAT-506)	6dB		
AT 4	Att,(CAT-506)	6dB		
C 1	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 2	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 3	Cer,(RPD670C472M50V)	4700pF,±20%,50V		Q'ty 2, Parallel
C 4	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 5	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 6	Elect,(CE04W1E470)	47μF,±20%,25V		
C 7	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 8	Cer,(CC924CH1H150J)	15pF,±5%,50V		
C 9	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 10	Cer,(RD340CK0R5CY50)	0.5pF,±0.25pF,50V		
C 11	Cer,(RPN710CH471J50V)	470pF,±5%,50V		
C 12	Cer,(RPN710CH471J50V)	470pF,±5%,50V		
C 13	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 14	Cer,(RD340CK0R5CY50)	0.5pF,±0.25pF,50V		
C 15	Var,cer,(TZ03R300A)	5.2 to 30pF,100V		
C 16	Elect,(CE04W1V100)	10μF,±20%,35V		
C 17	Cer,(CC924CH1H050D)	5pF,±0.5pF,50V		
C 18	Cer,(CC924CH1H100D)	10pF,±0.5pF,50V		
C 19	Cer,(CC924CH1H050D)	5pF,±0.5pF,50V		
C 20	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 21	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 22	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 23	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 24	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 25	Elect,(CE04W1E470)	47μF,±20%,25V		
C 26	Cer,(CC924CH1H150J)	15pF,±5%,50V		
C 27	Elect,(CE04W1J1R0)	1μF,±20%,63V		
C 28	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 29	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 30	Cer,(RD340CK010CY50)	1pF,±0.25pF,50V		Q'ty 0 or 1, *
C 31	Cer,(DF553F102PY50)	1000pF,+100/-0%,50V		
C 32	Cer,(DF553F102PY50)	1000pF,+100/-0%,50V		
C 33	Cer,(DF553F102PY50)	1000pF,+100/-0%,50V		
C 34	Cer,(DF553F102PY50)	1000pF,+100/-0%,50V		
C 35	Cer,(DF553F102PY50)	1000pF,+100/-0%,50V		
C 36	Elect,(CE04W1V220)	22μF,±20%,35V		
C 37	Elect,(CE04W1V220)	22μF,±20%,35V		
C 38	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		

( ): Manufacturer's part number
* : Selected at factory

Table 6-2 COMPONENT LIST OF IF OSCILLATOR & AMPLIFIER (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
C 39	Elect,(CE04W1V220)	22μF,±20%,35V		
C 40	Cer,(DF553F102PY50)	1000pF,+100/-0%,50V		
C 41	Not assigned			
C 42	Elect,(CE04W1J1R0)	1μF,±20%,63V		
C 43	Cer,(RPN710C223M50V)	0.022μF,±20%,50V		
C 44	Cer,(CC924CH1H**)	10 to 150pF,±0.5pF, ±5%,50V		
C 45	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 46	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 47	Cer,(RPN710C223M50V)	0.022μF,±20%,50V		
C 48	Cer,(RPN710C223M50V)	0.022μF,±20%,50V		
C 49	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 50	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 51	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 52	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 53	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 54	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 55	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 56	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 57	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 58	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 59	Cer,(CK924C1H222M)	2200pF, 20%,50V		
C 60	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 61	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 62	Cer,(RPN710C223M50V)	0.022μF,±20%,50V		
C 63	Cer,(RPN710C223M50V)	0.022μF,±20%,50V		
C 64	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 65	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 66	Cer,(RPN710C223M50V)	0.022μF,±20%,50V		
C 67	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 68	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 69	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 70	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 71	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 72	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 73	Cer,(RPN710C223M50V)	0.022μF,±20%,50V		
C 74	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 75	Elect,(CE04W1A470)	47μF,±20%,10V		
C 76	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 77	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 78	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 79	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 80	Cer,(CC924CH1H330J)	33pF,±5%,50V		
C 81	Cer,(CC924CH1H330J)	33pF,±5%,50V		
C 82	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 83	Cer,(RD340CX*CY50)	0.5 to 1pF,±0.25pF, 50V		Q'ty 0 or 1, *

( ): Manufacturer's part number
* : Selected at factory

Table 6-2 COMPONENT LIST OF IF OSCILLATOR & AMPLIFIER (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
	Cer,(CC924CK1H020C)	2pF,±0.25pF,50V		
C 84	Cer,(RD340CK*CY50)	0.5 to 1pF,±0.25pF, 50V		Q'ty 0 or 1 *
	Cer,(CC924CK1H020C)	2pF,±0.25pF,50V		
C 85	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 86	Elect,(CE04W1V220)	22μF,±20%,35V		
C 87	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 88	Elect,(CE04W1V220)	22μF,±20%,35V		
C 89	Elect,(CE04W1V220)	22μF,±20%,35V		
C 90	Elect,(CE04W1V220)	22μF,±20%,35V		
C 91	Elect,(CE04W1V220)	22μF,±20%,35V		
C 92	Elect,(CE04W1V220)	22μF,±20%,35V		
C 93	Elect,(CE04W1V220)	22μF,±20%,35V		
C 94	Elect,(CE04W1V220)	22μF,±20%,35V		
C 95	Elect,(CE04W1V220)	22μF,±20%,35V		
C 96	Elect,(CE04W1V220)	22μF,±20%,35V		
C 97	Cer,(CK924C1H222M)	2200pF,±20%,50V		
C 98	Cer,(CK924C1H222M)	2200pF,±20%,50V		
C 99	Cer,(CK924C1H222M)	2200pF,±20%,50V		
C 100	Cer,(CK924C1H222M)	2200pF,±20%,50V		
C 101	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 102	Cer,(RPN710C223M50V)	0.022μF,±20%,50V		
C 103	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 104	Cer,(RD340CK0R5CY50)	0.5pF,±0.25pF,50V		
C 105	Cer,(CC924CH1H040D)	4pF,±0.5pF, 0V		
C 106	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 107	Cer,(RD340CK0R5CY50)	0.5pF,±0.25pF,50V		
C 108	Cer,(RD340CK0R5CY50)	0.5pF,±0.24pF,50V		
C 109	Cer,(CC924CK1H020C)	2pF,±0.5pF,50V		
C 110	Elect,(CE04W1J010M)	1μF,±20%,63V		
C 111	Cer,(CK924C1H222M)	2200pF,±20%,50V		
J 1	Not assigned			
J 2	Not assigned			
J 3	Connector,(PI011-2M)	2 pins		
J 4	Connector,(PI011-2M)	2 pins		
J 5	Receptacle,(BNC-R-NI)			
J 6	Receptacle,(BNC-R601)			
J 7	Connector,(PI011-5M)	5 pins		
J 8	Connector,(PI011-6M)	6 pins		
J 9	Connector,(PI011-3M)	3 pins		
J 10	Connector,(PI011-2M)	2 pins		
J 11	Connector,(PI011-10M)	10 pins		
L 1	Coil,(LH1-471K)	470μH		
L 2	Coil,(442L71369A)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-2 COMPONENT LIST OF IF OSCILLATOR & AMPLIFIER (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
L 3	Coil,(442L71369B)			
L 4	Microinductor,(LF8-221K)	220μH		
L 5	Microinductor,(LF8-101K)	100μH		
L 6	Coil			Pattern
L 7	Coil,(44L42744B)			
L 8	Not assigned			
L 9	Not assigned			
L 10	Not assigned			
L 11	Coil			Pattern
L 12	Coil			Pattern
L 13	Coil,(LH1-102K)	1mH		
L 14	Coil,(442L71369A)			
L 15	Coil,(442L71369C)			
L 16	Microinductor,(LF8-221K)	220μH		
L 17	Microinductor,(LF8-221K)	220μH		
L 18	Coil			Pattern
L 19	Coil,(44L42744B)			
L 20	Coil,(LH1-332K)	3.3mH		
L 21	Coil,(LH1-332K)	3.3mH		
L 22	Coil,(442T46012)			Q'ty 0 or 1,*
L 23	Coil,(442T46012)			Q'ty 0 or 1,*
L 24	Coil,(442T46012)			Q'ty 0 or 1,*
L 25	Coil,(442T46014B)			
L 26	Coil,(442T46012)			Q'ty 0 or 1,*
L 27	Coil,(442T46014B)			
L 28	Coil,(44L46022B)			
L 29	Coil,(44L46022A)			
L 30	Microinductor,(SP0408-R47M)	0.47μH		
L 31	Microinductor,(SP0408-R47M)	0.47μH		
L 32	Coil,(44L46022B)			
L 33	Microinductor,(LF8-221K)	220μH		
L 34	Not assigned			
L 35	Microinductor,(LF8-221K)	220μH		
L 36	Microinductor,(LF8-221K)	220μH		
L 37	Microinductor,(LF8-221K)	220μH		
L 38	Microinductor,(LF8-221K)	220μH		
L 39	Microinductor,(LF8-221K)	220μH		

( ): Manufacturer's part number
* : Selected at factory

Table 6-2 COMPONENT LIST OF IF OSCILLATOR & AMPLIFIER (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
L 40	Microinductor,(FS0810-331K)	330μH		
L 41	Microinductor,(SP0408-6R8)	6.8μH		
Q 1	Tr,Si,NPN,(2SC1252)			
Q 2	Di,var,(1S2208)			
Q 3	Di,var,(1S2208)			
Q 4	Di,PIN,(1SV28)			Q'ty 2, Parallel
Q 5	Not assigned			
Q 6	Tr,Si,NPN,(2SC1252)			
Q 7	Di,var,(1S2208)			
Q 8	Di,var,(1S2208)			
Q 9	Tr,Si,NPN,(2SC1833)			
Q 10	Not assigned			
Q 11	Tr,Si,NPN,(2SC2148)			
Q 12	Tr,Si,NPN,(2SC2148)			
Q 13	Di,Si,(1S2222)			
Q 14	Di,Si,(1S2222)			
Q 15	Di,Si,(1S2222)			
Q 16	Di,Si,(1S2222)			
Q 17	Di,Si,(1S2222)			
Q 18	Di,Si,(1S2222)			
Q 19	Di,Si,(1S2222)			
Q 20	Di,Si,(1S2222)			
Q 21	Tr,Si,NPN,(2SC1251)			
Q 22	Tr,Si,NPN,(2SC1251)			
Q 23	Tr,Si,NPN,(2SC1252)			
Q 24	Tr,Si,NPN,(2SC1251)			
Q 25	Di,Si,(1SS97)			
Q 26	Di,Si,(1SS97)			
Q 27	Not assigned			
Q 28	IC,(μPC251C)			
Q 29	IC,(μPC251C)			
Q 30	Not assigned			
Q 31	Tr,Si,NPN,(2SC1254)			
Q 32	IC,(TC4069)			
Q 33	IC,(74LS74A)			
Q 34	Tr,Si,NPN,(2SC1254)			
Q 35	Tr,Si,NPN,(2SC1254)			
Q 36	IC,(74LS86)			
Q 37	Di,breakdown,(RD11EB)	10.4 to 11.6V,400mW		
Q 38	Di,breakdown,(RD7.5EB)	7.0 to 7.9V,400mW		
Q 39	Tr,Si,NPN,(2SC2148)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-2 COMPONENT LIST OF IF OSCILLATOR & AMPLIFIER (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
R 1	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R 2	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R 3	CF,(ARD25T330J)	33Ω,±5%,1/4W		
R 4	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 5	MF,(NRTF1/4C*J)	10 to 68Ω,±5%,1/4W		Q'ty 0 or 1,*
R 6	MF,(NRTF1/4C220ΩJ)	220Ω,±5%,1/4W		
R 7	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R 8	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R 9	CF,(ARD25T330J)	33Ω,±5%,1/4W		
R 10	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 11	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 12	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 13	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W		
R 14	CF,(ARD25T*J)	100Ω to 3.3kΩ,±5%,1/4W		*
R 15	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 16	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 17	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 18	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 19	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 20	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 21	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 22	CF,(ARD25T*J)	22 to 220Ω,±5%,1/4W		*
R 23	Var,MF,(RJ-6P 500Ω)	500Ω,1/2W		
R 24	MF,(NRN1/4C4 150ΩD)	150Ω,±0.5%,1/4W		
R 25	MF,(NRN1/4C4 71.2ΩD)	71.2Ω,±0.5%,1/4W		
R 26	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R 27	MF,(NRN1/4C4 332ΩD)	332Ω,±0.5%,1/4W		
R 28	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R 29	MF,(ARD25T391J)	390Ω,±5%,1/4W		
R 30	MF,(NRTF1/4C 470ΩJ)	470Ω,±5%,1/4W		
R 31	MF,(NRN1/4C4 71.2ΩD)	71.2Ω,±0.5%,1/4W		
R 32	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 33	MF,(NRN1/4C4 332ΩD)	332Ω,±0.5%,1/4W		
R 34	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 35	CF,(ARD25T121J)	120Ω,±5%,1/4W		
R 36	MF,(NRTF1/4C 330ΩJ)	330Ω,±5%,1/4W		
R 37	MF,(RN14K2E12R7D)	12.7Ω,±0.5%,1/4W		
R 38	MF,(RN14K2E422OD)	422Ω,±0.5%,1/4W		
R 39	MF,(RN14K2E422OD)	422Ω,±0.5%,1/4W		
R 40	MF,(RN14K2E12R7D)	12.7Ω,±0.5%,1/4W		
R 41	MF,(RN14K2E21R0D)	21.0Ω,±0.5%,1/4W		
R 42	MF,(RN14K2E2490D)	249Ω,±0.5%,1/4W		
R 43	MF,(RN14K2E2490D)	249Ω,±0.5%,1/4W		
R 44	MF,(RN14K2E21R0D)	21.0Ω,±0.5%,1/4W		
R 45	MF,(NRN1/4C4 71.2ΩD)	71.2Ω,±0.5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-2 COMPONENT LIST OF IF OSCILLATOR & AMPLIFIER (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
R 46	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R 47	MF,(NRTF1/4C 220ΩJ)	220Ω,±5%,1/4W		
R 48	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 49	MF,(NRTF1/4C 33ΩJ)	33Ω,±5%,1/4W		
R 50	MF,(NRN1/4C4 35.7ΩD)	35.7Ω,±0.5%,1/4W		
R 51	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 52	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 53	Var,MF,(RJ-6P 200Ω)	200Ω,1/2W		
R 54	MF,(NRTF1/4C 150ΩJ)	150Ω,±5%,1/4W		
R 55	MF,(NRN1/4C4 11.5ΩD)	11.5Ω,±0.5%,1/4W		
R 56	CF,(ARD25T100J)	10Ω,±5%,1/4W		
R 57	MF,(NRN1/4C4 11.5ΩD)	11.5Ω,±0.5%,1/4W		
R 58	MF,(RN14K2H101J)	100Ω,±5%,1/4W		
R 59	MF,(NRN1/4C4 35.7ΩD)	35.7Ω,±0.5%,1/4W		
R 60	CF,(ARD25T560J)	56Ω,±5%,1/4W		
R 61	MF,(NRN1/4C4 75ΩD)	75Ω,±0.5%,1/4W		
R 62	MF,(NRTF1/4C 23.7ΩJ)	23.7Ω,±5%,1/4W		
R 63	CF,(ARD25T181J)	180Ω,±5%,1/4W		
R 64	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 65	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R 66	MF,(NRN1/4C4 75ΩD)	75Ω,±0.5%,1/4W		
R 67	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 68	CF,(ARD25T301J)	300Ω,±5%,1/4W		
R 69	MF,(NRN1/4C4 107ΩD)	107Ω,±0.5%,1/4W		
R 70	MF,(NRN1/4C4 204ΩD)	204Ω,±0.5%,1/4W		
R 71	MF,(NRN1/4C4 75ΩD)	75Ω,±0.5%,1/4W		
R 72	MF,(NRN1/4C4 125.3ΩD)	125.3Ω,±0.5%,1/4W		
R 73	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 74	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 75	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 76	CF,(ARD25T121J)	120Ω,±5%,1/4W		
R 77	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 78	CF,(ARD25T334J)	330kΩ,±5%,1/4W		
R 79	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 80	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 81	CF,(ARD25T822J)	8.2kΩ,±5%,1/4W		
R 82	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 83	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 84	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 85	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 86	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 87	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 88	CF,(ARD25T121J)	120Ω,±5%,1/4W		
R 89	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 90	CF,(ARD25T104J)	100kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-2 COMPONENT LIST OF IF OSCILLATOR & AMPLIFIER (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
R 91	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 92	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 93	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 94	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 95	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 96	Not assigned			
R 97	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 98	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 99	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 100	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 101	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 102	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 103	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W		
R 104	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R 105	MF,(NRN1/4C4 332ΩD)	332Ω,±0.5%,1/4W		
R 106	MF,(NRN1/4C4 35.7ΩD)	35.7Ω,±0.5%,1/4W		
R 107	MF,(NRN1/4C4 332ΩD)	332Ω,±0.5%,1/4W		
R 108	MF,(NRN1/4C4 71.2ΩD)	71.2Ω,±0.5%,1/4W		
R 109	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 110	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 111	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R 112	MF,(NRN1/4C4 332ΩD)	332Ω,±0.5%,1/4W		
R 113	MF,(NRTF1/4C 330ΩJ)	330Ω,±5%,1/4W		
R 114	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
X 1	XTAL OSC,(44X71356/A)			A type
	XTAL OSC,(44X71356/B)			B type
	XTAL OSC,(44X71356/C)			C type
Z 1	1GHz L.P.F			Pattern
Z 2	M6 DBM			

( ): Manufacturer's part number
* : Selected at factory

Table 6-3 COMPONENT LIST OF COUNTER (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 2	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 3	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 4	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 5	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 6	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 7	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 8	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 9	Cer,(CC924CH1H470J)	47pF,±5%,50V		
C 10	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 11	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 12	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 13	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 14	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 15	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 16	Not assigned			
C 17	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 18	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 19	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 20	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 21	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 22	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 23	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 24	Elect,(CE04W1V220)	22μF,±20%,35V		
C 25	Elect,(CE04W1V220)	22μF,±20%,35V		
C 26	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 27	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 28	Elect,(CE04W1V220)	22μF,±20%,35V		
C 29	Elect,(CE04W1V220)	22μF,±20%,35V		
C 30	Cer,(CK924F104Z)	0.1μF,+80/-20%,50V		
C 31	Not assigned			
C 32	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 33	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 34	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 35	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 36	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 37	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 38	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 39	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 40	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 41	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 42	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 43	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 44	Cer,(CK924F1H104Z)	0.1μF,+80/-20%,50V		
C 45	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 46	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 47	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		

( ): Manufacturer's part number
* : Selected at factory

Table 6-3 COMPONENT LIST OF COUNTER (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
J 1	Connector,(PI021-2M)	2 pins		
J 2	Connector,(PI021-2M)	2 pins		
J 3	Connector,(PI021-2M)	2 pins		
J 4	Not assigned			
J 5	Connector,(HIF23A-40D-AA40S)			
J 6	Connector			Pattern
L 1	Microinductor,(LF8-101K)	100μH		
L 2	Microinductor,(LF8-221K)	220μH		
L 3	Microinductor,(LF8-221K)	220μH		
L 4	Microinductor,(LF8-221K)	220μH		
L 5	Microinductor,(LF8-221K)	220μH		
L 6	Microinductor,(LF8-221K)	220μH		
L 7	Microinductor,(LF8-221K)	220μH		
L 8	Microinductor,(LF8-221K)	220μH		
L 9	Microinductor,(LF8-220K)	22μH		
L 10	Microinductor,(LF8-221K)	220μH		
L 11	Microinductor,(LF8-221K)	220μH		
Q 1	Tr,Si,NPN,(2SC2148)			
Q 2	Tr,Si,NPN,(2SC2148)			
Q 3	Di,Si,(1S953)			
Q 4	IC,(MD10231)			
Q 5	IC,(MD10131)			
Q 6	IC,(MD10125)			
Q 7	IC,(74LS290)			
Q 8	Not assigned			
Q 9	Not assigned			
Q 10	Not assigned			

( ): Manufacturer's part number
* : Selected at factory.

Table 6-3 COMPONENT LIST OF COUNTER (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
Q 11	Not assigned			
Q 12	Not assigned			
Q 13	Not assigned			
Q 14	Not assigned			
Q 15	Not assigned			
Q 16	Not assigned			
Q 17	IC,(74LS08)			
Q 18	IC,(74LS02)			
Q 19	IC,(74LS74A)			
Q 20	IC,(74LS14)			
Q 21	IC,(74LS74A)			
Q 22	IC,(74LS74A)			
Q 23	Not assigned			
Q 24	IC,(74LS75)			
Q 25	Not assigned			
Q 26	IC,(74LS32)			
Q 27	Not assigned			
Q 28	IC,(74LS290)			
Q 29	IC,(74LS290)			
Q 30	IC,(74LS290)			
Q 31	IC,(74LS08)			
Q 32	IC,(TC-5032P)			
Q 33	IC,(74LS04)			
Q 34	Not assigned			
Q 35	IC,(74LS04)			
Q 36	Not assigned			
Q 37	Not assigned			
Q 38	IC,(74LS367)			
Q 39	IC,(74LS367)			
Q 40	IC,(74LS148)			
Q 41	IC,(74LS04)			
Q 42	IC,(74LS283)			
Q 43	IC,(TC4053BP)			
Q 44	IC,(μPC251C)			
Q 45	IC,(TC4053BP)			
Q 46	IC,(MC14433)			
Q 47	IC,(74LS02)			
Q 48	IC,(74LS32)			
Q 49	Not assigned			
Q 50	Not assigned			
Q 51	Not assigned			
Q 52	IC,(74LS08)			
Q 53	IC,(74LS02)			
Q 54	IC,(74LS107)			
Q 55	IC,(74LS244)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-3 COMPONENT LIST OF COUNTER (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
Q 56	IC,(74LS125)			
Q 57	IC,(74LS74A)			
Q 58	IC,(74LS08)			
Q 59	IC,(74LS290)			
Q 60	IC,(74LS290)			
Q 61	IC,(74LS290)			
Q 62	IC,(74LS00)			
Q 63	IC,(74LS157)			
Q 64	IC,(74LS74A)			
Q 65	IC,(74LS32)			
Q 66	Not assigned			
Q 67	IC,(74LS08)			
Q 68	IC,(7489)			
Q 69	Di,breakdown,(1S752)	0.2 to 3.2V,250mV		
Q 70	Not assigned			
Q 71	IC,(74LS08)			
Q 72	IC,(74LS32)			
Q 73	IC,(74LS05)			
Q 74	IC,(74LS75)			
Q 75	IC,(74LS02)			
R 1	MF,(NRN1/4C4 75ΩD)	75Ω,±0.5%,1/4W		
R 2	CF,(ARD25T220J)	22Ω,±5%,1/4W		
R 3	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R 4	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 5	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 6	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 7	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 8	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R 9	CF,(ARD25T100J)	10Ω,±5%,1/4W		
R 10	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 11	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 12	CF,(ARD25T511J)	510Ω,±5%,1/4W		
R 13	CF,(ARD25T511J)	510Ω,±5%,1/4W		
R 14	CF,(ARD25T511J)	510Ω,±5%,1/4W		
R 15	CF,(ARD25T511J)	510Ω,±5%,1/4W		
R 16	CF,(ARD25T511J)	510Ω,±5%,1/4W		
R 17	CF,(ARD25T511J)	510Ω,±5%,1/4W		
R 18	CF,(ARD25T511J)	510Ω,±5%,1/4W		
R 19	CF,(ARD25T511J)	510Ω,±5%,1/4W		
R 20	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 21	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 22	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 23	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 24	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 25	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-3 COMPONENT LIST OF COUNTER (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
R 26	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 27	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 28	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 29	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 30	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 31	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 32	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 33	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 34	CF,(ARD25T474J)	470kΩ,±5%,1/4W		
R 35	Single in-line array,(IHR-8-472JA)	4.7kΩ,1/8W		
R 36	Not assigned			
R 37	Not assigned			
R 38	Not assigned			
R 39	Not assigned			
R 40	Not assigned			
R 41	Not assigned			
R 42	Not assigned			
R 43	Not assigned			
R 44	Not assigned			
R 45	Var,MF,(RJ-6S 1kΩ)	1kΩ,1/2W		
R 46	MF,(RN14K2E2211D)	2.21kΩ,±0.5%,1/4W		
R 47	Var,MF,(RJ-6S 1kΩ)	1kΩ,1/2W		
R 48	MF,(RN14K2E3241D)	3.24kΩ,±0.5%,1/4W		
R 49	Var,MF,(RJ-6S 1kΩ)	1kΩ,1/2W		
R 50	MF,(RN14K2E3651D)	3.65kΩ,±0.5%,1/4W		
R 51	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 52	Not assigned			
R 53	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 54	Var,MF,(RJ-6S 20kΩ)	20kΩ,1/2W		
R 55	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 56	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 57	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 58	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 59	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 60	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W		
R 61	CF,(ARD25T154J)	150kΩ,±5%,1/4W		
R 62	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 63	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 64	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 65	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 66	Single in-line array,(IHR-4-471JA)	470Ω,1/8W		
R 67	Not assigned			
R 68	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 69	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 70	MF,(RN14K2E4221D)	4.22kΩ,±0.5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-3 COMPONENT LIST OF COUNTER (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
R 71	MF,(RN14K2E4021D)	4.02kΩ,±0.5%,1/4W		
R 72	MF,(RN14K2E3241D)	3.24kΩ,±0.5%,1/4W		
R 73	Var,MF,(RJ-6S 10kΩ)	10kΩ,1/2W		
R 74	Single in-line array, (IHR-6-102JA)	1kΩ,1/8W		
R 75	Not assigned			
R 76	Not assigned			
R 77	Not assigned			
R 78	Single in-line array, (IHR-6-102JA)	1kΩ,1/8W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-4 COMPONENT LIST OF SWEEP OSCILLATOR & BB AMPLIFIER (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Not assigned			
C 2	Elect,(CE04W1J010)	1μF,±20%,63V		
C 3	Not assigned			
C 4	Elect,(CE04W1J010)	1μF,±20%,63V		
C 5	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 6	Elect,(CE04W1V220)	22μF,±20%,35V		
C 7	Elect,(CE04W1J010)	1μF,±20%,63V		
C 8	Elect,(CE04W1J010)	1μF,±20%,63V		
C 9	Elect,(CE04W1V100)	10μF,±20%,35V		
C 10	Elect,(CE04W1J010)	1μF,±20%,63V		
C 11	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 12	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 13	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 14	Elect,(CE04W1J010)	1μF,±20%,63V		
C 15	Tant,(CS02H1V010M)	1.0μF,±20%,35V		
C 16	Tant,(CS02H1V010M)	1.0μF,±20%,35V		
C 17	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 18	Elect,(CE04W1J010)	1μF,±20%,63V		
C 19	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 20	Elect,(CE04W1A101)	100μF,±20%,10V		
C 21	Elect,(CE04W1J010)	1μF,±20%,63V		
C 22	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 23	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 24	Cer,(CC924CH1H680J)	68pF,±5%,50V		
C 25	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 26	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 27	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 28	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 29	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 30	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 31	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 32	Plast,(ECQ-M1H *KZ)	0.022μ to 0.1μF, ±10%,50V		*
C 33	Plast,(ECQ-M1H *KZ)	0.022μ to 0.1μF, ±10%,50V		*
C 34	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 35	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 36	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 37	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 38	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 39	Elect,(CE04W1E470)	47μF,±20%,25V		
C 40	Elect,(CE04W1V221)	220μF,±20%,35V		
C 41	Elect,(CE04W1E101)	100μF,±20%,25V		
C 42	Elect,(CE04W1E101)	100μF,±20%,25V		
C 43	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 44	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 45	Elect,(CE04W1V220)	22μF,±20%,35V		

( ): Manufacturer's part number
* : Selected at factory

Table 6-4 COMPONENT LIST OF SWEEP OSCILLATOR & BB AMPLIFIER (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
C 46	Elect,(CE04W1V220)	22μF,±20%,35v		
C 47	Elect,(CE04W1V220)	22μF,±20%,35V		
C 48	Elect,(CE04W1V220)	22μF,±20%,35V		
C 49	Elect,(CE04W1V100)	10μF,±20%,35V		
C 50	Elect,(CE04W1V100)	10μF,±20%,35V		
C 51	Elect,(CE04W1V100)	10μF,±20%,35v		
C 52	Not assigned			
C 53	Elect,(CE04W1V220)	22μF,±20%,35V		
C 54	Elect,(CE04W1V220)	22μF,±20%,35V		
C 55	Elect,(CE04W1V220)	22μF,±20%,35V		
C 56	Elect,(CE04W1V220)	22μF,±20%,35V		
C 57	Elect,(CE04W1V220)	22μF,±20%,35V		
C 58	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 59	Elect,(CE04W1V220)	22μF,±20%,35V		
C 60	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 61	Elect,(CE04W1V220)	22μF,±20%,35V		
C 62	Elect,(CE04W1V220)	22μF,±20%,35V		
C 63	Elect,(CE04W1V220)	22μF,±20%,35V		
C 64	Elect,(CE04W1V220)	22μF,±20%,35V		
C 65	Cer,(CC924CH1H470J)	47pF,±5%,50V		
C 66	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 67	Elect,(CE04W1E470)	47μF,±20%,25V		
C 68	Elect,(CE04W1A101)	100μF,±20%,10V		
C 69	Elect,(CE04W1A101)	100μF,±20%,10V		
J 1	Receptacle,(27DP-P-1.5)			
J 2	Receptacle,(BNC-R-NI)			
J 3	Receptacle,(27DP-P-1.5)			
J 4	Receptacle,(BNC-R-NI)			
K 1	Reed relay,(MT03A)			
K 2	Reed relay,(MT03A)			
K 3	Reed relay,(MT03A)			
K 4	Reed relay,(MT03A)			
L 1	Microinductor,(LF8-221K)	220μH		
L 2	Microinductor,(LF8-221K)	220μH		
L 3	Microinductor,(LF8-221K)	220μH		
L 4	Microinductor,(LF8-221K)	220μH		
L 5	Microinductor,(LF8-221K)	220μH		

( ): Manufacturer's part number
* : Selected at factory

Table 6-4 COMPONENT LIST OF SWEEP OSCILLATOR & BB AMPLIFIER (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
L 6	Microinductor,(LF8-221K)	200μH		
L 7	Microinductor,(LF8-470K)	47μH		
L 8	Microinductor,(LF8-221K)	200μH		
L 9	Microinductor,(SP0408-R47K)			
Q 1	J-FET,N ch,(3SK28)			
Q 2	Tr,Si,NPN,(2SC1254)			
Q 3	Tr,Si,NPN,(2SC1254)			
Q 4	Not assigned			
Q 5	Di,breakdown,(RD11EB)	10.4 to 11.6V,400mW		
Q 6	Not assigned			
Q 7	Tr,Si,NPN,(2SC1254)			
Q 8	Tr,Si,NPN,(2SC1252)			
Q 9	Di,Si,(1SS97)			
Q 10	Di,Si,(1SS97)			
Q 11	IC,(μPC251C)			
Q 12	IC,(μPC251C)			
Q 13	IC,(μPC251C)			
Q 14	IC,(μPA39A)			
Q 15	IC,(TC4053BR)			
Q 16	Di,breakdown,(RD3.9E)	3.7 to 4.4V,400mW		
Q 17	IC,(μPC14308H)			
Q 18	Not assigned			
Q 19	Di,breakdown,(RD3.9E)	3.7 to 4.4V,400mW		
Q 20	Di,breakdown,(RD3.9E)	3.7 to 4.4V,400mW		
Q 21	J-FET,N ch,(2SK55E)			
Q 22	Di,Si,(1S953)			
Q 23	Di,breakdown,(RD3.9E)	3.7 to 4.4V,400mW		
Q 24	Di,breakdown,(RD3.9E)	3.7 to 4.4V,400mW		
Q 25	IC,(μPC251C)			
Q 26	J-FET,N ch,(2SK55E)			
Q 27	Di,Si,(1S953)			
Q 28	Tr,Si,NPN,(2SC1833)			
Q 29	IC,(μPC251C)			
Q 30	Tr,Si,NPN,(2SC1833)			
Q 31	J-FET,N ch,(2SK55E)			
Q 32	Di,Si,(1S953)			
Q 33	Di,breakdown,(RD3.9E)	3.7 to 4.4V,400mW		
Q 34	Di,breakdown,(RD3.9E)	3.7 to 4.4V,400mW		
Q 35	IC,(μPC151C)			
Q 36	J-FET,N ch,(2SK55E)			
Q 37	Di,Si,(1S953)			
Q 38	IC,(μPC251C)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-4 COMPONENT LIST OF SWEEP OSCILLATOR & BB AMPLIFIER (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
Q 39	IC,(μPC251C)			
Q 40	IC,(P588-G50-552)			
Q 41	IC,(μPC251C)			
Q 42	Di,Si,(1S953)			
Q 43	Di,Si,(1S953)			
Q 44	Di,Si,(1S953)			
Q 45	Tr,Si,NPN,(2SC1833)			
Q 46	IC,(74LS290)			
Q 47	IC,(μPC251C)			
Q 48	IC,(μPC154A)			
Q 49	Tr,Si,NPN,(2SC1833)			
Q 50	Di,Si,(1S953)			
Q 51	Di,Si,(1S953)			
Q 52	Tr,Si,NPN,(2SC1008)			
Q 53	Tr,Si,PNP,(2SA708)			
Q 54	IC,(μPC251C)			
Q 55	Di,Si,(1S953)			
Q 56	Di,Si,(1S953)			
Q 57	Di,breakdown,(02BZ2.2)	1.88 to 2.56V,250mW		
Q 58	IC,(TC4053BP)			
Q 59	IC,(μPC151C)			
Q 60	Di,Si,(1S953)			
Q 61	IC,(74LS14)			
Q 62	Di,Si,(1S953)			
Q 63	Di,Si,(1S953)			
Q 64	Di,Si,(1S953)			
Q 65	Di,Si,(1S953)			
Q 66	Di,Si,(1S953)			
Q 67	Di,Si,(1S953)			
Q 68	Di,Si,(1S953)			
R 1	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 2	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 3	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 4	CF,(ARD25T121J)	120Ω,±5%,1/4W		
R 5	CF,(ARD25T100J)	10Ω,±5%,1/4W		
R 6	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 7	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 8	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 9	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 10	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 11	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 12	Not assigned			
R 13	Not assigned			
R 14	Not assigned			
R 15	Not assigned			
R 16	CF,(ARD25T150J)	15Ω,±5%,1/4W		
R 17	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-4 COMPONENT LIST OF SWEEP OSCILLATOR & BB AMPLIFIER (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
R 18	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 19	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 20	CF,(ARD25T*J)	3.3k to 100kΩ,±5%, 1/4W		Q'ty 1 or 2,*
R 21	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R 22	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 23	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 24	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 25	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 26	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 27	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 28	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 29	Var,MF,(RJ-6P 100Ω)	100Ω,1/2W		
R 30	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 31	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 32	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 33	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R 34	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 35	Not assigned			
R 36	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 37	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 38	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R 39	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 40	Var,MF,(RJ-6S 10kΩ)	10kΩ,1/2W		
R 41	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 42	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 43	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R 44	MF,(RN14K2E2211D)	2.21kΩ,±0.5%,1/4W		
R 45	Var,MF,(RJ-6S 500kΩ)	500kΩ,1/2W		
R 46	MF,(RN14K2E9311D)	9.31kΩ,±0.5%,1/4W		
R 47	Var,WW,(442R42845)	60Ω,2mW		
R 48	CF,(ARD25T6R8J)	6.8Ω,±5%,1/4W		
R 49	MF,(RN14K2E7680D)	768Ω,±0.5%,1/4W		
R 50	Var,MF,(RJ-6S 2kΩ)	2kΩ,1/2W		
R 51	Var,MF,(RJ-6S 50kΩ)	50kΩ,1/2W		
R 52	Var,MF,(RJ-6S 100kΩ)	100kΩ,1/2W		
R 53	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 54	Not assigned			
R 55	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 56	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 57	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 58	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 59	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 60	CF,(ARD25T*J)	2.2k to 4.7kΩ,±5%, 1/4W		*

( ): Manufacturer's part number
* : Selected at factory

Table 6-4 COMPONENT LIST OF SWEEP OSCILLATOR & BB AMPLIFIER (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
R 61	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 62	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 63	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 64	CF,(ARD25T220J)	22Ω,±5%,1/4W		
R 65	CF,(ARD25T273J)	27kΩ,±5%,1/4W		
R 66	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 67	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 68	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 69	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 70	CF,(ARD25T334J)	330kΩ,±5%,1/4W		
R 71	CF,(ARD25T751J)	750Ω,±5%,1/4W		
R 72	CF,(ARD25T*J)	100Ω to 1.5kΩ,±5%, 1/4W		Q'ty 0 or 1,*
R 73	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 74	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 75	CF,(ARD25T684J)	680kΩ,±5%,1/4W		
R 76	CF,(ARD25T*J)	75k to 150kΩ,±5%, 1/4W		*
R 77	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 78	CF,(ARD25T*J)	100Ω to 1.5kΩ,±5%, 1/4W		Q'ty 0 or 1,*
R 79	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 80	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 81	CF,(ARD25T474J)	470kΩ,±5%,1/4W		
R 82	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 83	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 84	CF,(ARD25T822J)	8.2kΩ,±5%,1/4W		
R 85	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 86	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 87	CF,(ARD25T*J)	100k to 1MΩ,±5%,1/4W		Q'ty 0 or 1*
R 88	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 89	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 90	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 91	CF,(ARD25T*J)	56k to 100kΩ,±5%, 1/4W		* Option
R 92	CF,(ARD25T*J)	1k to 33kΩ,±5%,1/4W		* Option
R 93	CF,(ARD25T*J)	56k to 100kΩ,±5%, 1/4W		* Option
R 94	Var,MF,(RJ-6S 20kΩ)	20kΩ,1/2W		
R 95	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 96	CF,(ARD25T220J)	22Ω,±5%,1/4W		
R 97	CF,(ARD25T273J)	27kΩ,±5%,1/4W		
R 98	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 99	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 100	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 101	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 102	CF,(ARD25T154J)	150kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-4 COMPONENT LIST OF SWEEP OSCILLATOR & BB AMPLIFIER (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
R 103	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 104	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		
R 105	CF,(ARD25T334J)	330kΩ,±5%,1/4W		
R 106	CF,(ARD25T154J)	150kΩ,±5%,1/4W		
R 107	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 108	CF,(ARD25T822J)	8.2kΩ,±5%,1/4W		
R 109	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 110	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 111	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 112	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 113	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 114	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 115	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 116	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 117	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 118	Var,MF,(RJ-6S 500Ω)	500Ω,1/2W		
R 119	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R 120	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 121	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 122	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 123	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 124	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 125	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 126	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 127	CF,(ARD25T220J)	22Ω,±5%,1/4W		
R 128	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 129	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 130	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 131	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 132	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 133	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 134	CF,(ARD25T560J)	56Ω,±5%,1/4W		
R 135	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 136	Var,MF,(RJ-6S 1kΩ)	1kΩ,1/2W		
R 137	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 138	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 139	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 140	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 141	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 142	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 143	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 144	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 145	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 146	Var,MF,(RJ-6S 1kΩ)	1kΩ,1/2W		
R 147	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 148	Var,MF,(RJ-6S 50kΩ)	50kΩ,1/2W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-4 COMPONENT LIST OF SWEEP OSCILLATOR & BB AMPLIFIER (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
R 149	Var,MF,(RJ-6S 100kΩ)	100kΩ,1/2W		
R 150	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 151	CF,(ARD25T271J)	270Ω,±5%,1/4W		
R 152	CF,(ARD25T270J)	27Ω,±5%,1/4W		
R 153	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 154	Var,MF,(RJ-6S 10kΩ)	10kΩ,1/2W		
R 155	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 156	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 157	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 158	CF,(ARD25T*J)	470Ω to 1kΩ,±5%, 1/4W		*
R 159	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
※ 160	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		
R 161	Var,MF,(RJ-6P 2kΩ)	2kΩ,1/2W		
R 162	Not assigned			
R 163	Not assigned			
R 164	Not assigned			
R 165	Not assigned			
R 166	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 167	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 168	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
※ 169	CF,(ARD25T124J)	120kΩ,±5%,1/4W		
R 170	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 171	CF,(ARD25T123J)	12kΩ,±5%,1/4W		
R 172	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
※ 173	CF,(ARD25T223J)	22kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

44W73731 | 8/8

Table 6-5 COMPONENT LIST OF BB OSCILLATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CC924CH1H080D)	8pF,±0.5pF,50V		
	Cer,(CC924CH1H330J)	33pF,±5%,50V		
C 2	Var,Cer,(TZ03T110A)	11pF,100V		
C 3	Cer,(CC924CH1H221J)	220pF,±5%,50V		
C 4	Cer,(CC924CH1H221J)	220pF,±5%,50V		
C 5	Cer,(CC924CH1H221J)	220pF,±5%,50V		
C 6	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 7	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 8	Not assigned			
C 9	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 10	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 11	Cer,(CC924CH1H330J)	33pF,±5%,50V		
C 12	Var,Cer,(TZ03T110A)	11pF,100V		
C 13	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C 14	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C 15	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C 16	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 17	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 18	Not assigned			
C 19	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 20	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 21	Cer,(CC924CH1H330J)	33pF,±5%,50V		
C 22	Var,Cer,(TZ03T110A)	11pF,100V		
C 23	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 24	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 25	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 26	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 27	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 28	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 29	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 30	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 31	Cer,(CC924CH1H330J)	33pF,±5%,50V		
C 32	Var,Cer,(TZ03T110A)	11pF,100V		
C 33	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 34	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 35	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 36	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 37	Plast,(ECQ-M1H 332KZ)	3300pF,±10%,50V		
C 38	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 39	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 40	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 41	Cer,(CC924CH1H330J)	33pF,±5%,50V		
C 42	Var,Cer,(TZ03T110A)	11pF,100V		
C 43	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 44	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 45	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 46	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 47	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		

( ): Manufacturer's part number
* : Selected at factory

44W73732 | 1/7

Table 6-5 COMPONENT LIST OF BB OSCILLATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
C 48	Not assigned			
C 49	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 50	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 51	Cer,(CC924CH1H220J)	22pF,±5%,50V		
C 52	Var,Cer,(TZ03T110A)	11pF,100V		
C 53	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 54	Cer,(CC924CH1H331J)	330pF,±5%,50V		
	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 55	Cer,(CC924CH1H331J)	330pF,±5%,50V		
	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 56	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 57	Plast,(ECQ-M1H 332KZ)	3300pF,±10%,50V		
C 58	Plast,(ECQ-M1H 332KZ)	3300pF,±10%,50V		Q'ty 0 or 1
C 59	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 60	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 61	Cer,(CC924CH1H470J)	47pF,±5%,50V		
C 62	Var,Cer,(TZ03T110A)	11pF,100V		
C 63	Cer,(CC924CH1H221J)	220pF,±5%,50V		
C 64	Cer,(CC924CH1H221J)	220pF,±5%,50V		
C 65	Cer,(CC924CH1H221J)	220pF,±5%,50V		
C 66	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 67	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 68	Elect,(CE04W1V220)	22μF,±20%,35V		
C 69	Elect,(CE04W1V220)	22μF,±20%,35V		
C 70	Plast,(ECQ-M1H*KZ)	0.022μ to 0.047μF, ±10%,50V		*
C 71	Plast,(ECQ-M1H*KZ)	1000pF to 0.01μF, ±10%,50V		*
C 72	Plast,(ECQ-M1H*KZ)	4700pF, to 0.01μF ±10%,50V		*
C 73	Plast,(ECQ-P1*PZ)	2200 to 3900pF,±1%, 100V		*
C 74	Plast,(ECQ-M1H*KZ)	0.01μ to 0.022μF, ±10%,50V		*
C 75	Plast,(ECQ-P1*PZ)	3300 to 6800pF,±1%, 100V		*
C 76	Elect,(CE04W1V220)	22μF,±20%,25V		
C 77	Elect,(CE04W1V220)	22μF,±20%,35V		
C 78	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 79	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 80	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 81	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 82	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 83	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 84	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 85	Elect,(CE04W1V220)	22μF,±20%,35V		
C 86	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 87	Elect,(CE04W1V220)	22μF,±20%,35V		
C 88	Elect,(CE04W1J010)	1μF,±20%,63V		

( ): Manufacturer's part number
* : Selected at factory

44W73732 | 2/7

Table 6-5 COMPONENT LIST OF BB OSCILLATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
C 89	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 90	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 91	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 92	Elect,(CE04W1V220)	22μF,±20%,35V		
C 93	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 94	Elect,(CE04W1V220)	22μF,±20%,35V		
C 95	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 96	Elect,(CE04W1V220)	22μF,±20%,35V		
C 97	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 98	Plast,(ECQ-M1H*KZ)	0.01μ to 0.022μF, ±10%,50V		*
C 99	Elect,(CE04W1A101)	100μF,±20%,10V		
C 100	Plast,(ECQ-M1H*KZ)	4700pF to 0.01μF, ±10%,50V		*
C 101	Elect,(CE04W1J010)	1μF,±20%,63V		
C 102	Elect,(CE04W1J010)	1μF,±20%,63V		
C 103	Cer,(CC924CH1H050D)	5pF,±0.5%,50V		
C 104	Cer,(CC924CH1H050D)	5pF,±0.5%,50V		
C 105	Plast,(ECQ-P1*PZ)	2200 to 3900pF,±1%, 100V		*
C 106	Plast,(ECQ-P1*PZ)	3300 to 6800pF,±1%, 100V		*
J 1	Connector,(PI021-2M)	2 pins		
J 2	Receptacle,(27DP-BR)			
J 3				Pattern
L 1	Coil,(10K17-65T)			
L 2	Coil,(10K17-65T)			
L 3	Coil,(10K17-85T)			
L 4	Coil,(10K17-85T)			
L 5	Var,coil,(LV1-010)	1μH		
L 6	Var,coil,(LV1-1R5)	1.5μH		A type
L 7	Not assigned			
L 8	Var,coil,(LV1-3R3)	3.3μH		
L 9	Var,coil,(LV1-470)	47μH		
L 10	Var,coil,(LV1-221)	220μH		
L 11	Microinductor,(LF8-221K)	220μH		
L 12	Microinductor,(LF8-221K)	220μH		
L 13	Microinductor,(LF8-221K)	220μH		
L 14	Microinductor,(LF8-221K)	220μH		
L 15	Microinductor,(LF8-221K)	220μH		

( ): Manufacturer's part number
* : Selected at factory

44W73732 | 3/7

Table 6-6 COMPONENT LIST OF CRYSTAL OSCILLATOR & BB SWEEPER (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
R 31	Var,MF,(RJ-6S 20kΩ)	20kΩ,1/2W		
R 32	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 33	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 34	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 35	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 36	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 37	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 38	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 39	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 40	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 41	CF,(ARD25T684J)	680kΩ,±5%,1/4W		
R 42	CF,(ARD25T684J)	680kΩ,±5%,1/4W		
R 43	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 44	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 45	Var,MF,(RJ-6P 50kΩ)	50kΩ,1/2W		
R 46	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 47	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 48	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 49	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 50	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 51	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 52	Not assigned			
R 53	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 54	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 55	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 56	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 57	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		
R 58	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 59	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 60	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 61	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 62	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 63	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 64	CF,(ARD25T301J)	300Ω,±5%,1/4W		
R 65	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 66	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 67	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 68	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 69	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 70	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 71	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 72	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 73	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 74	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 75	CF,(ARD25T681J)	680Ω,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-6 COMPONENT LIST OF CRYSTAL OSCILLATOR & BB SWEEPER (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
R 76	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 77	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R 78	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 79	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		
R 80	MF,(RN14K2E2741D)	2.74kΩ,±0.5%,1/4W		
R 81	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 82	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 83	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 84	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 85	MF,(RN14K2E1151D)	1.15kΩ,±0.5%,1/4W		
R 86	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 87	CF,(ARD25T560J)	56Ω,±5%,1/4W		
R 88	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W		
R 89	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 90	MF,(NRN1/4C4 17.4ΩD)	17.4Ω,±0.5%,1/4W		
R 91	CF,(ARD25T271J)	270Ω,±5%,1/4W		
R 92	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 93	CF,(ARD25T*J)	22k to 47kΩ,±5%,1/4W		*
R 94	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 95	Var,MF,(RJ-6S 20kΩ)	20kΩ,1/2W		
R 96	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 97	CF,(ARD25T220J)	22Ω,±5%,1/4W		
R 98	CF,(ARD25T273J)	27kΩ,±5%,1/4W		
R 99	Var,MF,(RJ-6S 10kΩ)	10kΩ,1/2W		
R 100	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 101	CF,(ARD25T154J)	150kΩ,±5%,1/4W		
R 102	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 103	CF,(ARD25T*J)	1k to 4.7kΩ,±5%,1/4W		
R 104	CF,(ARD25T334J)	330kΩ,±5%,1/4W		
R 105	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 106	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 107	Thermistor,(OS-D5-300-1)	300Ω		
R 108	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 109	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 110	CF,(ARD25T331J)	330Ω,±5%,I/4W		
R 111	CF,(ARD25T271J)	270Ω,±5%,1/4W		
X 1	XTAL OSC,(44X46820)	70MHz		
X 2	XTAL OSC,(44X46821)	140MHz		
Z 1	M7 D.B.M			

( ): Manufacturer's part number
* : Selected at factory

Table 6-7 COMPONENT LIST OF MOTHER BOARD (Z8)

CKT REF	DESCRIPTION	RATING		NOTE
J 1	Connector,(U-PB1521)	15 pins		
J 2	Connector,(225J-22221-587)	44 pins		
J 3	Connector,(225J-22221-587)	44 pins		
J 4	Connector,(225J-22221-587)	44 pins		
J 5	Connector,(225J-22221-587)	44 pins		
J 6	Not assigned			
J 7	Not assigned			
J 8	Connector,(U-PB1519)	15 pins		
J 9	Connector,(U-PB2219)	22 pins		
J 10	Connector,(HIF23A-50D-AA20S)	50 pins		
J 11	Connector,(U-PA1019)	10 pins		
J 12	Connector,(U-PB1519)	15 pins		
Q 1	Di,Si,(1S953)			
Q 2	Di,Si,(1S953)			
Q 3	Di,Si,(1S953)			
R 1	CF,(ARD25T*J)	3.3k to 47kΩ,±5%, 1/4W		Q'ty 1 or 2 *

( ): Manufacturer's part number
* : Selected at factory

Table 6-8 COMPONENT LIST OF LED BOARD (Z9)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 2	Not assigned			
C 3	Plast,(ECQ-M1H 223K)	0.022μF,±10%,50V		
C 4	Plast,(ECQ-M1H 223K)	0.022μF,±10%,50V		
C 5	Plast,(ECQ-M1H 223K)	0.022μF,±10%,50V		
C 6	Elect,(CE04W1V100)	10μF,±20%,35V		
C 7	Elect,(CE04W1A221)	220μF,±20%,10V		
C 8	Elect,(CE04W1V220)	22μF,±20%,35V		
C 9	Elect,(CE04W1V220)	22μF,±20%,35V		
C 10	Not assigned			
C 11	Elect,(CE04W1V220)	22μF,±20%,35V		
C 12	Not assigned			
C 13	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 14	Not assigned			
C 15	Cer,(CK9241H104M)	0.1μF,±10%,50V		
C 16	Cer,(CK9241H104M)	0.1μF,±10%,50V		
C 17	Cer,(CK924C1H472M)	4700pF,±10%,50V		
J 1	Connector,(HIF3-49P-2.54DSA)	40 pins		
J 2	Connector,(U-PA1021)	10 pins		
J 3	Connector,(U-PA1021)	10 pins		
K 1	Relay,(NF2-12V)			
L 1	Microinductor,(LH1-102K)	1mH		
L 2	Not assigned			
L 3	Microinductor,(LF8-221K)	220μH		
Q 1	IC,(74LS157)			
Q 2	IC,(74LS248)			
Q 3	IC,(μPA56C)			
Q 4	IC,(74LS248)			
Q 5	IC,(μPA56C)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-8 COMPONENT LIST OF LED BOARD (Z9)

CKT REF	DESCRIPTION	RATING		NOTE
Q 6	IC,(74LS248)			
Q 7	IC,(μPA56C)			
Q 8 to Q 19	Indicator,(LN513GK)	7 segments		
Q 20	Not assigned			
Q 21	IC,(μPA57C)			
Q 22	IC,(μPA56C)			
Q 23	Not assigned			
Q 24	Not assigned			
Q 25	IC,(μPA57C)			
Q 26	LED,(LN38GP)			
Q 27	LED,(LN38GP)			
Q 28	LED,(LN38GP)			
Q 29	LED,(LN38GP)			
Q 30	LED,(LN38GP)			
Q 31	LED,(LN38GP)			
Q 32	Not assigned			
Q 33	Not assigned			
Q 34	Not assigned			
Q 35	Not assigned			
Q 36	Not assigned			
Q 37	LED,(LN38GP)			
Q 38	LED,(LN38GP)			
Q 39	LED,(LN38GP)			
Q 40	LED,(LN38GP)			
Q 41	LED,(LN38GP)			
Q 42	LED,(LN38GP)			
Q 43	Not assigned			
Q 44	Not assigned			
Q 45	Not assigned			
Q 46	LED,(LN38GP)			
Q 47	LED,(LN38GP)			
Q 48	LED,(LN38GP)			
Q 49	LED,(LN38GP)			
Q 50	LED,(LN38GP)			
Q 51	LED,(LN38GP)			
Q 52	Not assigned			
Q 53	Not assigned			
Q 54	Not assigned			
Q 55	LED,(LN38GP)			
Q 56	LED,(LN38GP)			
Q 57	LED,(LN38GP)			
Q 58	LED,(LN38GP)			
Q 59	LED,(LN38GP)			
Q 60	LED,(LN38GP)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-8 COMPONENT LIST OF LED BOARD (Z9)

CKT REF	DESCRIPTION	RATING		NOTE
Q 61 to Q 72	Not assigned			
Q 73	LED,(LN38GP)			
Q 74	LED,(LN38GP)			
Q 75	LED,(LN38GP)			
Q 76	LED,(LN38GP)			
Q 77	Not assigned			
Q 78	LED,(LN38GP)			
Q 79	LED,(LN38GP)			
Q 80	Not assigned			
Q 81	Not assigned			
Q 82	Di,Si,(1S953)			
Q 83	Di,Si,(1S953)			
Q 84	Not assigned			
Q 85	IC,(74LS04)			
Q 86	IC,(74LS00)			
Q 87	IC,(74LS00)			
Q 88	IC,(74LS04)			
Q 89	IC,(74LS74A)			
Q 90	IC,(74LS74A)			
Q 91	IC,(μPA57C)			
Q 92	Tr,Si,PNP,(2SA539)			
Q 93	Di,Si,(1S953)			
Q 94	Di,Si,(1S953)			
Q 95	Di,breakdown,(1SZ52)	5.9 to 6.5V,250mW		
R 1	CF,(ARD25T100J)	10Ω,±5%,1/4W		
R 2	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 3	CF,(ARD25T100J)	10Ω,±5%,1/4W		
R 4	CF,(ARD25T100J)	10Ω,±5%,1/4W		
R 5	CF,(ARD25T100J)	10Ω,±5%,1/4W		
R 6	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 7	Not assigned			
R 8	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 9	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 10	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 11	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 12	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 13	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 14	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 15	CF,(ARD25T681J)	680Ω,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-8 COMPONENT LIST OF LED BOARD (Z9)

CKT REF	DESCRIPTION	RATING		NOTE
R 16	Not assigned			
R 17	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 18	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 19	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 20	Not assigned			
R 21	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R 22	Var,MF,(RG161N20SB 1kΩM)	1kΩ,1/2W		
R 23	MF,(RN14K2E1001D)	10kΩ,±0.5%,1/4W		
R 24	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 25	Var,MF,(RG161N20SB 100ΩM)	100Ω,1/2W		
R 26	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 27	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 28	Var,MF,(20HP-5S 10kΩ)	10kΩ		
R 29	Not assigned			
R 30	MF,(RN14K2E3012D)	30.1kΩ,±0.5%,1/4W		
R 31	Single in-line array, (IHR-4-472JA)	4.7kΩ,1/8W		
R 32	Single in-line array, (IHR-4-152JA)	1.5kΩ,1/8W		
R 33	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 34	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 35	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 36	Var,MF,(RG161N20SB 10kΩM)	10kΩ,1/2W		
R 37	MF,(RN14K2E1302D)	13kΩ,±0.5%,1/4W		
R 38	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 39	Not assigned			
R 40	Single in-line array, (AHR-680JB)	68Ω,1/8W		
R 41	Single in-line array, (AHR-680JB)	68Ω,1/8W		
R 42	Single in-line array, (AHR-680JB)	68Ω,1/8W		
S 1	Slide,(SL7-4(PH)8H6-2-2)			ME538A/B/C
S 2	Not assigned			
S 3	Not assigned			
S 4	Switch,(KEC11902)			option
S 5	Switch,(KEC11902)			
S 6	Switch,(KEC11902)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-9 COMPONENT LIST OF FRONT BOARD (Z10)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 2	Elect,(CE04W1E470)	47μF,±20%,25V		
C 3	Tant,(CS02H1V010M)	1μF,±20%,35V		
C 4	Tant,(CS02H1V010M)	1μF,±20%,35V		
C 5	Tant,(CS02H1V010M)	1μF,±20%,35V		
C 6	Plast,(ECQ-P1 334FZ)	0.33μF,±1%,100V		
C 7	Plast,(ECQ-P1 334FZ)	0.33μF,±1%,100V		
C 8	Not assigned			
C 9	Not assigned			
C 10	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 11	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 12	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 13	Elect,(CE04W1J1R0)	1μF,±20%,63V		
C 14	Tant,(CS02H1V010M)	1μF,±20%,35V		
C 15	Tant,(CS02H1V010M)	1μF,±20%,35V		
C 16	Tant,(CS02H1D2R2M)	2.2μF,±20%,20V		
C 17	Cer,(CC924CH1H680J)	68pF,±5%,50V		
C 18	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 19	Not assigned			
C 20	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 21	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 22	Elect,(CE04W1V220)	22μF,±20%,35V		
C 23	Elect,(CE04W1J1R0)	1μF,±20%,63V		
C 24	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 25	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
	Cer,(RPE111CH751G50)	750pF,±2%,50V		
C 26	Cer,(CC924CH1H221J)	220pF,±5%,50V		
	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 27	Plast,(ECQ-M1H 332KZ)	3300pF,±10%,50V		
	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 28	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 29	Plast,(ECQ-M05 332KZ)	3300pF,±10%,50V		
	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C 30	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 31	Elect,(CE04W1E221)	220μF,±20%,25V		
C 32	Elect,(CE04W1V220)	22μF,±20%,35V		
C 33	Elect,(CE04W1V220)	22μF,±20%,35V		
C 34	Elect,(CE04W1E101)	100μF,±20%,25V		
C 35	Elect,(CE04W1E221)	220μF,±20%,25V		
C 36	Elect,(CE04W1V220)	22μF,±20%,35V		
C 37	Elect,(CE04W1V220)	22μF,±20%,35V		
C 38	Elect,(CE04W1V220)	22μF,±20%,35V		
C 39	Elect,(CE04W1V220)	22μF,±20%,35V		
C 40	Elect,(CE04W1V220)	22μF,±20%,35V		
C 41	Elect,(CE04W1V220)	22μF,±20%,35V		
C 42	Elect,(CE04W1V220)	22μF,±20%,35V		
C 43	Elect,(CE04W1V220)	22μF,±20%,35V		

( ): Manufacturer's part number
* : Selected at factory

Table 6-9 COMPONENT LIST OF FRONT BOARD (Z10)

CKT REF	DESCRIPTION	RATING		NOTE
C 44	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 45	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 46	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 47	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 48	Elect,(CE04W1J2R2)	2.2μF,±20%,35V		
C 49	Elect,(CE04W1V220)	22μF,±20%,35V		
C 50	Not assigned			
C 51	Elect,(CE04W1V220)	22μF,±20%,35V		
C 52	Elect,(CE04W1V220)	22μF,±20%,35V		
C 53	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 54	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 55	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 56	Cer,(CC924CH1H560J)	56pF,±5%,50V		
J 1	Connector,(HIF3A-50P-2.54DSA)	50 pins		
J 2	Connector,(PI011-2M)	2 pins		
J 3	Connector,(PI011-2M)	2 pins		
J 4	Not assigned			
J 5	Connector,(PI011-2M)	2 pins		
J 6	Panel jack,(SP-3CPJ)			
J 7	Plug,(BNC-P620)			
J 8	Connector,(PI011-2M)	2 pins		
L 1	Coil,(FS0810S-471K)	470μH		
L 2	Not assigned			
L 3	Coil,(339T20168H)			
L 4	Not assigned			
L 5	Coil,(LH1-102K)	1mH		
L 6	Coil,(LH1-333K)	33mH		
L 7	Coil,(LH1-333K)	33mH		
L 8	Microinductor,(LF8-221K)	220μH		
L 9	Microinductor,(LF8-221K)	220μH		
L 10	Var,coil,(LV4-902)			
L 11	Var,coil,(LV4-712)			
L 12	Var,coil,(LV4-712)			
L 13	Microinductor,(LF8-221K)	220μH		
L 14	Microinductor,(LF8-221K)	220μH		
L 15	Microinductor,(LF8-221K)	220μH		

( ): Manufacturer's part number
* : Selected at factory

44W73736 2/6

Table 6-9 COMPONENT LIST OF FRONT BOARD (Z10)

CKT REF	DESCRIPTION	RATING		NOTE
L 16	Microinductor,(LF8-221K)	220μH		
L 17	Microinductor,(LF8-221K)	220μH		
L 18	Microinductor,(LF8-221K)	220μH		
L 19	Microinductor,(LF8-221K)	220μH		
L 20	Coil,(44L46022F)			
L 21	Coil,(44L46022F)			
L 22	Microinductor,(LF8-221K)	220μH		
Q 1	IC,(μPC251C)			
Q 2	IC,(μPC251C)			
Q 3	IC,(μPC251C)			
Q 4	J-FET,N ch,(2SK55E)			
Q 5	Di,Si,(1S953)			
Q 6	Di,Si,(1S953)			
Q 7	Di,Si,(1S953)			
Q 8	Di,Si,(1S953)			
Q 9	Di,Si,(1S953)			
Q 10	Tr,Si,NPN,(2SC1253)			
Q 11	Di,breakdown,(1SZ52)	5.9 to 6.5V,250mW		
Q 12	Tr,Si,NPN,(2SC1254)			
Q 13	Not assigned			
Q 14	Not assigned			
Q 15	IC,(74121)			
Q 16	Tr,Si,NPN,(2SC1254)			
Q 17	Tr,Si,NPN,(2SC1254)			
Q 18	Tr,Si,PNP,(2SA711)			
Q 19	Tr,Si,PNP,(2SA711)			
Q 20	Tr,Si,PNP,(2SA883)			
Q 21	IC,(μPC258C)			
Q 22	Di,breakdown,(1SZ52)	5.9 to 6.5V,250mW		
Q 23	I ,(μPC154)			
Q 24	Not assigned			
Q 25	IC,(μPC151C)			
Q 26	Di,Si,(1S953)			
Q 27	Di,Si,(1S953)			
Q 28	IC,(μPC251C)			
Q 29	Di,Si,(1S953)			
Q 30	LED,(TLG226)			

( ): Manufacturer's part number
* : Selected at factory

44W73736 3/6

Table 6-9 COMPONENT LIST OF FRONT BOARD (Z10)

CKT REF	DESCRIPTION	RATING		NOTE
Q 31	IC,(μPC251C)			
Q 32	Di,Si,(1S953)			
Q 33	Not assigned			
Q 34	Di,breakdown,(RD9.1EB)	8.5 to 9.6V,400mW		
R 1	Var,MF,(RJ-6P 50kΩ)	50kΩ,1/2W		
R 2	Var,MF,(RJ-6P 50kΩ)	50kΩ,1/2W		
R 3	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 4	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 5	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W		
R 6	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W		
R 7	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 8	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 9	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 10	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 11	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 12	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 13	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 14	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 15	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 16	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 17	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 18	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 19	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R 20	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 21	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 22	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 23	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 24	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 25	MF,(NRN1/4C4 75ΩD)	75Ω,±0.5%,1/4W		
R 26	MF,(NRN1/4C4 35.7ΩD)	35.7Ω,±0.5%,1/4W		
R 27	MF,(NRN1/4C4 144.4ΩD)	144.4Ω,±0.5%,1/4W		
R 28	MF,(NRN1/4C4 107ΩD)	107Ω,±0.5%,1/4W		
R 29	MF,(NRN1/4C4 144.4ΩD)	144.4Ω,±0.5%,1/4W		
R 30	MF,(NRN1/4C4 91.7ΩD)	91.7Ω,±0.5%,1/4W		
R 31	MF,(NRN1/4C4 371ΩD)	371Ω,±0.5%,1/4W		
R 32	MF,(NRN1/4C4 91.7ΩD)	91.7Ω,±0.5%,1/4W		
R 33	MF,(NRN1/4C4 79.9ΩD)	79.9Ω,±0.5%,1/4W		
R 34	MF,(NRN1/4C4 1.185kΩD)	1.185kΩ,±0.5%,1/4W		
R 35	MF,(NRN1/4C4 79.9ΩD)	79.9Ω,±0.5%,1/4W		
R 36	MF,(NRN1/4C4 91.7ΩD)	91.7Ω,±0.5%,1/4W		
R 37	MF,(NRN1/4C4 371ΩD)	371Ω,±0.5%,1/4W		
R 38	MF,(NRN1/4C4 91.7ΩD)	91.7Ω,±0.5%,1/4W		
R 39	MF,(NRN1/4C4 91.7ΩD)	91.7Ω,±0.5%,1/4W		
R 40	MF,(NRN1.4C4 371ΩD)	371Ω,±0.5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

44W73736 4/6

Table 6-9 COMPONENT LIST OF FRONT BOARD (Z10)

CKT REF	DESCRIPTION	RATING		NOTE
R 41	MF,(NRN1/4C4 91.7ΩD)	91.7Ω,±0.5%,1/4W		
R 42	MF,(NRN1/4C4 91.7ΩD)	91.7Ω,±0.5%,1/4W		
R 43	MF,(NRN1/4C4 371ΩD)	371Ω,±0.5%,1/4W		
R 44	MF,(NRN1/4C4 91.7ΩD)	91.7Ω,±0.5%,1/4W		
R 45	MF,(NRN1/4C4 79.9ΩD)	79.9Ω,±0.5%,1/4W		
R 46	MF,(NRN1/4C4 1.185kΩD)	1.185kΩ,±0.5%,1/4W		
R 47	MF,(NRN1/4C4 79.9ΩD)	79.9Ω,±0.5%,1/4W		
R 48	MF,(NRN1/4C4 79.9ΩD)	79.9Ω,±0.5%,1/4W		
R 49	MF,(NRN1/4C4 1.185kΩD)	1.185kΩ,±0.5%,1/4W		
R 50	MF,(NRN1/4C4 79.9ΩD)	79.9Ω,±0.5%,1/4W		
R 51	MF,(NRN1/4C4 79.9ΩD)	79.9Ω,±0.5%,1/4W		
R 52	MF,(NRN1/4C4 1.185kΩD)	1.185kΩ,±0.5%,1/4W		
R 53	MF,(NRN1/4C4 79.9ΩD)	79.9Ω,±0.5%,1/4W		
R 54	Not assigned			
R 55	Not assigned			
R 56	Var,MF,(RG161N20SB 500ΩM)	500Ω,1/2W		
R 57	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R 58	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R 59	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 60	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 61	CF,(ARD25T391J)	390Ω,±5%,1/4W		
R 62	Not assigned			
R 63	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 64	Not assigned			
R 65	MF,(RN14K2E1501D)	1.5kΩ,±0.5%,1/4W		
R 66	CF,(ARD25T301J)	300Ω,±5%,1/4W		
R 67	Not assigned			
R 68	MF,(RN05E2B1002B)	10kΩ,±0.1%,1/4W		
R 69	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 70	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 71	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R 72	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 73	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 74	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 75	Not assigned			
R 76	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 77	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 78	MF,(RN14K2E1541D)	1.54kΩ,±0.5%,1/4W		
R 79	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 80	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 81	Var,MF,(RJ-6P 20kΩ)	20kΩ,±1/2W		
R 82	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 83	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 84	CF,(ARD25T474J)	470kΩ,±5%,1/4W		
R 85	CF,(ARD25T103J)	10kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

44W73736 5/6

Table 6-9 COMPONENT LIST OF FRONT BOARD (Z10)

CKT REF	DESCRIPTION	RATING		NOTE
R 86	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 87	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 88	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 89	CF,(ARD25T154J)	150kΩ,±5%,1/4W		
R 90	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 91	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 92	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 93	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R 94	CF,(ARD25T334J)	330kΩ,±5%,1/4W		
R 95	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 96	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 97	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 98	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 99	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 100	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 101	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R 102	CF,(ARD25T563J)	56kΩ,±5%,1/4W		
R 103	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 104	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R 105	Var,MF,(RG16IN20SB 20kΩM)	20kΩ,1/2W		
R 106	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 107	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 108	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 109	Var,MF,(RG16IN20SB 10kΩM)	10kΩ,1/2W		
R 110	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 111	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 112	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 113	CF,(ARD25T183J)	18kΩ,±5%,1/4W		
R 114	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 115	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R 116	CF,(ARD25T511J)	510Ω,±5%,1/4W		
R 117	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 118	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 119	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 120	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 121	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 122	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 123	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
S 1	Pushbutton,(10F102UGr 31)			
S 2	MPS33-317S			

( ): Manufacturer's part number
* : Selected at factory

44W73736 6/6

Table 6-10 COMPONENT LIST OF POWER SUPPLY (Z11)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 2	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 3	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 4	Not assigned			
C 5	Elect,(CE04W1E470)	47μF,±20%,25V		
C 6	Elect,(CE04W1E470)	47μF,±20%,25V		
C 7	Elect,(CE04W1E470)	47μF,±20%,25V		
C 8	Elect,(CE04W1E470)	47μF,±20%,25V		
C 9	Elect,(CE04W1E470)	47μF,±20%,25V		
C 10	Elect,(CE04W1E470)	47μF,±20%,25V		
J 1	Connector,(U-PB1521)	15 pins		
J 2	Connector,(U-PB1019)	10 pins		
J 3	Connector,(U-PB1521)	15 pins		
J 4	Connector,(U-SA1001)	10 pins		
M 1	Timer,(TM-O)			
Q 1	IC,(RB-152-LFB)			
Q 2	IC,(RB-152-LFB)			
Q 3	IC,(RB-152-LFB)			
Q 4	IC,(RB-152-LFB)			
Q 5	IC,(RB-152-LFB)			
Q 6	IC,(M4C-31-12)			
Q 7	IC,(μPC151C)			
Q 8	IC,(μPC14312H)			
Q 9	Di,breakdown,(RD6.2EB)	5.8 to 6.6V,400mW		
Q 10	IC,(μPC16312H)			
Q 11	Di,breakdown,(RD6.2EB)	5.8 to 6.6V,400mW		
Q 12	Not assigned			
Q 13	IC,(μPC16312H)			
Q 14	IC,(μPC16305H)			
R 1	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 2	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 3	CF,(ARD25T223J)	22kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

44W73737 1/2

Table 6-10 COMPONENT LIST OF POWER SUPPLY (Z11)

CKT REF	DESCRIPTION	RATING		NOTE
R 4	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 5	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 6	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 7	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 8	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 9	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 10	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 11	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 12	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 13	Not assigned			
R 14	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 15	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 16	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

44W73737 2/2

Table 6-11 COMPONENT LIST OF ME453A/B/C, ME538A/B/C RECEIVER

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Elect,(CE62C1V472)	4700μF,+50/-10%,35V		
C 2	Elect,(CE62C1C103)	10000μF,+50/-10%,16V		
C 3	Elect,(CE62C1C472)	4700μF,+50/-10%,16V		
C 4	Elect,(CE62C1V472)	4700μF,+50/-10%,35V		
C 5	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
F 1	Fuse,(MF51NN250V 3.15A AC05)	3.15A,250V		
F 2	Fuse,(MF51NN250V 3.15A AC05)	3.15A,250V		
G 1	Fan,(109-050)			
J 1	Panel jack,(SP-3CPJ or BNC-PJ608)			
J 2	Plug,(BNC-P620)			
J 3	Panel jack,(SP-3CPJ or BNC-PJ608)			
J 4	Plug,(BNC-P620)			
J 5	Panel jack,(SP-3CPJ or BNC-PJ608)			
J 6	Plug,(BNC-P620)			
J 7	Receptacle,(SP-3CR or BNC-R601NI)			
J 8	Connector,(PI011-02F)			
J 9	Connector,(PI011-02F)			
J 10	Receptacle,(BNC-R101-NI)			
J 11	Receptacle,(BNC-R101-NI)			
J 12	Receptacle,(BNC-R101-NI)			
J 13	Receptacle,(BNC-R101-NI)			
J 14	Receptacle,(BRN-R101-NI)			
J 15	Receptacle,(RNC-R101-NI)			
J 16	Connector,(U-SB1503)			
J 17	Connector,(U-SB1503)			
J 18	Connector,(U-SB1503)			
J 19	Connector,(PI011-03F)			
J 20	Connector,(PI011-07F)			
J 21	Connector,(PI011-07F)			
J 22	Connector,(PI011-02F)			
J 23	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

44W73713 1/3

Table 6-11 COMPONENT LIST OF ME453A/B/C, ME538A/B/C RECEIVER

CKT REF	DESCRIPTION	RATING		NOTE
J 24	Connector,(U-SB1503)			
J 25	Connector,(U-SB1503)			
J 26	Connector,(U-SB2203)			
J 27	Connector,(U-SB2203)			
J 28	Connector,(U-SA0503)			
J 29	Connector,(U-SB2203)			
J 30	Connector,(U-SB2203)			
J 31	Connector,(U-SA1003)			
J 32	Connector,(8843-2SPFL 4/364)			
J 33	Connector,(HIF3A-34D-AC40S)			
J 34	Connector,(HIF3A-26D-AC30S)			
J 35	Not assigned			
J 36	Earth terminal,(34E772)			
Q 1	Tr,Si,NPN,(2SC2199)			
Q 2	Tr,Si,NPN,(2SC2199)			
Q 3	Tr,Si,NPN,(2SC2199)			
Q 4	Tr,Si,NPN,(2SC2199)			
Q 5	Rectifier block,(M4C-6)			
Q 6	Rectifier block,(M4C-6)			
Q 7	Rectifier block,(M4C-6)			
R 1	Var,MF,(RG161N1SSB 1kΩM)	1kΩ,1/2W		
S 1	Pushbutton,(ESB-9997S)			
S 2	Slide,(SL7-4(PH)6.5H)			
S 3	Slide,(SL7-4(PH)6.5H)			
S 4	Slide,(SL7-4(PH)6.5H)			
S 5	Slide,(SL7-4(PH)6.5H)			
S 6	Slide,(SL7-4(PH)6.5H)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-11 COMPONENT LIST OF ME453A/B/C, ME538A/B/C RECEIVER

CKT REF	DESCRIPTION	RATING		NOTE
T 1	Trans,(44T64483)			
V 1	C.R.T.,(140DUB39)			
V 2	Neon lamp,(BNS-3RU-C)			
Z 1	RANGING AND AVG			44W73714
Z 2	PHASE DETECTOR			44W73715
Z 3	BB DETECTOR			44W73716
Z 4	DISCRIMINATOR			44W73717
Z 5	IF MIX AND RETURN LOSS			44W73718
Z 6	MARKER/SPECTRUM			44W73719
Z 7	CPU			
Z 8	GP-IB (OPTION)			44W73720
Z 9	MOTHER BOARD			44W73721
Z 10	OPERATING/LED BOARD			44W73722
Z 11	LED DRIVER			44W73723
Z 12	X SELECT, X-Y RECORDER			44W73724
Z 13	CRT DRIVER			44W73725
Z 14	POWER SUPPLY			44W73726
Z 15	AVG			44W72727
Z 16	POWER FILTER,(ZMB2203-13)			
Z 17	20dB MISMATCH,(449H 69287)			SP type
	or (449H 57077B)			BNC type
Z 18	CONNECTOR BOARD			

( ): Manufacturer's part number
* : Selected at factory

Table 6-12 COMPONENT LIST OF RANGING AND AVG (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 2	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 3	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 4	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 5	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 6	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 7	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 8	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 9	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 10	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 11	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 12	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 13	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 14	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 15	Not assigned			
C 16	Not assigned			
C 17	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 18	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 19	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 20	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 21	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 22	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 23	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 24	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 25	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 26	Plast,(ECQP1 273FZ)	0.027μF,±1%,100V		
C 27	Plast,(ECQP1 273FZ)	0.027μF,±1%,100V		
C 28	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 29	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 30	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 31	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 32	Not assigned			
C 33	Elect,(CE04W1A470)	47μF,±20%,10V		
C 34	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 35	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 36	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 37	Elect,(CE04W1V100)	10μF,±20%,35V		
C 38	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 39	Not assigned			
C 40	Not assigned			
C 41	Not assigned			
C 42	Not assigned			
C 43	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 44	Plast,(ECQ-M1H223KZ)	0.022pF,±20%,50V		
C 45	Cer,(CK924C1H472M)	4700pF,±20%,50V		

( ): Manufacturer's part number
* : Selected at factory

Table 6-12 COMPONENT LIST OF RANGING AND AVG (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
C 46	Elect,(CE04W1A470)	47μF,±20%,10V		
C 47	Elect,(CE04W1A470)	47μF,±20%,10V		
C 48	Elect,(CE04W1A470)	47μF,±20%,10V		
C 49	Elect,(CE04W1A470)	47μF,±20%,10V		
C 50	Cer,(CK924C1H222M)	2200pF,±20%,50V		
C 51 to C 61	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 62	Elect,(CE04W1A470)	47μF,±20%,10V		
C 63	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 64	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 65	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 66	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 67	Elect,(CE04W1A470)	47μF,±20%,10V		
C 68	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 69	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 70	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 71	Elect,(CE04W1A470)	47μF,±20%,10V		
C 72	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 73	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 74	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 75	Not assigned			
C 76	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 77	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 78	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 79	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 80	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 81	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 82	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 83	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 84	Cer,(CK924C1H472M)	4700pF,±20%,50V		
J 1	Produced by pattern			
J 2	Connector,(HIF3-34P-2.54DS)			
J 3	Connector,(PI021-02M)			
J 4	Connector,(HIF3-16P-2.54DS)			GP-IB Option
J 5	Connector,(μ-PA1521)			
J 6	Connector,(μ-PA2221)			
Q 1	IC,(TC4051BP)			
Q 2	IC,(TC4051BP)			
Q 3	IC,(TL082CP)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-12 COMPONENT LIST OF RANGING AND AVG (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
Q 4	IC,(μPC258C)			
Q 5	IC,(TC4051BP)			
Q 6	IC,(TC4051BP)			
Q 7	IC,(μPC251C)			
Q 8	IC,(TC4051BP)			
Q 9	IC,(TL082CP)			
Q 10	IC,(TL082CP)			
Q 11	Not assigned			
Q 12	Not assigned			
Q 13	Not assigned			
Q 14	Not assigned			
Q 15	Not assigned			
Q 16	Di,Si,(1S953)			
Q 17	Di,Si,(1S953)			
Q 18	IC,(TC4053BP)			
Q 19	IC,(TL082CP)			
Q 20	Di,Si,(1S953)			
Q 21	IC,(TC4051BP)			
Q 22	IC,(TC4051BP)			
Q 23	IC,(TC4051BP)			
Q 24	IC,(TL082CP)			
Q 25	IC,(μPC258C)			
Q 26	IC,(TC4051BP)			
Q 27	IC,(TC4051BP)			
Q 28	IC,(TL082CP)			
Q 29	Di,Si,(1S953)			
Q 30	Di,Si,(1S953)			
Q 31	IC,(TC4053BP)			
Q 32	Not assigned			
Q 33	Not assigned			
Q 34	Not assigned			
Q 35	Not assigned			
Q 36	Not assigned			
Q 37	Di,breakdown,(RD3.9EB)	3.7 to 4.1V,400mW		
Q 38	Di,breakdown,(RD3.9EB)	3.7 to 4.1V,400mW		
Q 39	IC,(TC4053BP)			
Q 40	Di,Si,(1S953)			
Q 41	IC,(TC4052BP)			
Q 42	IC,(μPC71A)			
Q 43	IC,(μPC251C)			
Q 44	Di,breakdown,(RD6.2EB)	5.8 to 6.6V,400mW		
Q 45	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 46	Di,Si,(1S953)			
Q 47	Di,Si,(1S953)			
Q 48	IC,(74LS74)			
Q 49	Not assigned			
Q 50	IC,(7450)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-12 COMPONENT LIST OF RANGING AND AVG (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
Q 51	IC,(74LS14)			
Q 52	IC,(74LS293)			
Q 53	IC,(TC4040BP)			
Q 54	Not assigned			
Q 55	Not assigned			
Q 56	Not assigned			
Q 57	Not assigned			
Q 58	Not assigned			
Q 59	Tr,Si,NPN,(2SC1833)			
Q 60	Tr,Si,NPN,(2SC1833)			
Q 61	Di,Si,(1S953)			
Q 62	Di,Si,(1S953)			
Q 63	IC,(μPC251C)			
Q 64	IC,(μPC251C)			
Q 65	IC,(μPC251C)			
Q 66	IC,(TC4052BP)			
Q 67	IC,(74LS00)			
Q 68	IC,(μPC251C)			
Q 69	IC,(TC4053BP)			
Q 70	IC,(TC4053BP)			
Q 71	IC,(TL082CP)			
Q 72	IC,(TL082CP)			
Q 73	Di,Si,(1S953)			
Q 74	Di,Si,(1S953)			
Q 75	IC,(74LS157)			
Q 76	IC,(μPC14308H)			
Q 77	IC,(μPC16308H)			
R 1	MF,(RN14K2E3011D)	3.01kΩ,±0.5%,1/4W		
R 2	MF,(RN14K2E2001D)	2kΩ,±0.5%,1/4W		
R 3	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 4	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 5	MF,(RN14K2E2001D)	2kΩ,±0.5%,1/4W		
R 6	MF,(RN14K2E4990D)	499Ω,±0.5%,1/4W		
R 7	MF,(RN14K2E1001D)	1kΩ,±0.5%,1/4W		
R 8	MF,(RN14K2E2491D)	2.49kΩ,±0.5%,1/4W		
R 9	MF,(RN14K2E4991D)	4.99kΩ,±0.5%,1/4W		
R 10	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 11	MF,(RN14K2E2002D)	20kΩ,±0.5%,1/4W		
R 12	MF,(RN14K2E4991D)	4.99kΩ,±0.5%,1/4W		
R 13	MD,(RN14K2E4872D)	48.7kΩ,±0.5%,1/4W		
R 14	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R 15	MF,(RN14K2E1003D)	100kΩ,±0.5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory,

Table 6-12 COMPONENT LIST OF RANGING AND AVG (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
R 16	Not assigned			
R 17	Not assigned			
R 18	Not assigned			
R 19	Not assigned			
R 20	Not assigned			
R 21	MF,(RN14K2E1003D)	100kΩ,±0.5%,1/4W		
R 22	CF,(ARD25T474J)	470kΩ,±5%,1/4W		
R 23	Var,MF,(RJ-6S 100kΩ)	100kΩ,1/2W		
R 24	Single in-line array, (IHR-8-104JA)	100kΩ		
R 25	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 26	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 27	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W		
R 28	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 29	CF,(ARD25T684J)	680kΩ,±5%,1/4W		
R 30	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 31	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 32	CF,(ARD25T684J)	680kΩ,±5%,1/4W		
R 33	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 34	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 35	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 36	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 37	Not assigned			
R 38	Not assigned			
R 39	Not assigned			
R 40	Not assigned			
R 41	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 42	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 43	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 44	CF,(ARD25R104J)	100kΩ,±5%,1/4W		
R 45	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 46	Var,MF,(RJ-6S 100kΩ)	100kΩ,1/2W		
R 47	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 48	CF,(ARD25T393J)	39kΩ,±5%,1/4W		
R 49	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 50	Single in-line array, (IHR-8-104JA)	100kΩ		
R 51	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 52	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 53	MF,(RN14K2E2001D)	2kΩ,±0.5%,1/4W		
R 54	MF,(RN14K2E4990D)	499Ω,±0.5%,1/4W		
R 55	MF,(RN14K2E1001D)	1kΩ,±0.5%,1/4W		
R 56	MF,(RN14K2E2491D)	2.49kΩ,±0.5%,1/4W		
R 57	MF,(RN14K2E4991D)	4.99kΩ,±0.5%,1/4W		
R 58	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 59	MF,(RN14K2E2002D)	20kΩ,±0.5%,1/4W		
R 60	MF,(RN14K2E4991D)	4.99kΩ,±0.5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-12 COMPONENT LIST OF RANGING AND AVG (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
R 61	MF,(RN14K2E4872D)	48.7kΩ,±0.5%,1/4W		
R 62	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R 63	MF,(RN14K2E1003D)	100kΩ,±0.5%,1/4W		
R 64	Not assigned			
R 65	Not assigned			
R 66	Not assigned			
R 67	Not assigned			
R 68	Not assigned			
R 69	Not assigned			
R 70	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 71	CF,(ARD25T684J)	680kΩ,±5%,1/4W		
R 72	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 73	CF,(ARD25T824J)	820kΩ,±5%,1/4W		
R 74	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 75	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 76	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 77	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 78	Var,MF,(RJ-6P 100kΩ)	100Ω,1/2W		
R 79	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 80	Var,MF,(RJ-6S 10kΩ)	10kΩ,1/2W		
R 81	MF,(RN14K2E1003D)	100kΩ,±0.5%,1/4W		
R 82	CF,(ARD25T474J)	470kΩ,±5%,1/4W		
R 83	Var,MF,(RJ-6S 100kΩ)	100kΩ,1/2W		
R 84	Not assigned			
R 85	Not assigned			
R 86	Not assigned			
R 87	Not assigned			
R 88	Not assigned			
R 89	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 90	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 91	MF,(RN14K2E1001D)	1kΩ,±0.5%,1/4W		
R 92	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 93	MF,(RN14K2E4021D)	4.02kΩ,±0.5%,1/4W		
R 94	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 95	Var,MF,(RJ-6P 500kΩ)	500kΩ,1/2W		
R 96	CF,(ARD25T684J)	680kΩ,±5%,1/4W		
R 97	CF,(ARD25T823J)	82kΩ,±5%,1/4W		
R 98	CF,(ARD25T104J)	10kΩ,±5%,1/4W		
R 99	CF,(ARD25T104J)	10kΩ,±5%,1/4W		
R 100	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 101	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 102	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 103	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 104	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 105	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-12 COMPONENT LIST OF RANGING AND AVG.(Z1)

CKT REF	DESCRIPTION	RATING		NOTE
R 106	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 107	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 108	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 109	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 110	Not assigned			
R 111	Not assigend			
R 112	Not assigned			
R 113	Not assigend			
R 114	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 115	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 116	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 117	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 118	CF,(ARD25T154J)	150kΩ,±5%,1/4W		
R 119	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 120	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 121	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 122	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 123	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 124	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R 125	Var,MF,(RJ-6P 500kΩ)	500kΩ,1/2W		
R 126	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 127	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 128	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 129	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 130	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 131	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 132	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 133	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 134	Not assigned			
R 135	Not assigned			
R 136	Not assigned			
R 137	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 138	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 139	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 140	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 141	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 142	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 143	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 144	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 145	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 146	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 147	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 148	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 149	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 150	CF,(ARD25T102J)	1kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

44W73714 | 7/8

Table 6-12 COMPONENT LIST OF RANGING AND AVG (Z1)

CKT REF	DESCRIPTION	RATING		NOTE
R 151	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 152	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 153	MF,(RN14K2E4021D)	4.02kΩ,±0.5%,1/4W		
R 154	MF,(RN14K2E1001D)	1kΩ,±0.5%,1/4W		
R 155	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 156	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 157	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 158	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 159	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 160	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 161	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 162	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 163	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 164	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 165	MF,(RN14K2E1003D)	100kΩ,±0.5%,1/4W		
R 166	MF,(RN14K2E4992D)	49.9kΩ,±0.5%,1/4W		
R 167	MF,(RN14K2E4992D)	49.9kΩ,±0.5%,1/4W		
R 168	MF,(RN14K2E1003D)	100kΩ,±0.5%,1/4W		
R 169	Var,MF,(RJ-6S 10kΩ)	10kΩ,1/2W		
R 170	Not assigned			
R 171	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R 172	Not assigned			
R 173	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R 174	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 175	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 176	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 177	CF,(ARD25T102J)	1kΩ, ±5%,1/4W		
R 178	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 179	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 180	Not assigned			
R 181	CF,(ARD25T823J)	82kΩ,±5%,1/4W		
R 182	CF,(ARD25T562J)	5.6k , 5%,1/4W		
R 183	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 184	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 185	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R 186	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 187	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		

( ): Manufacturer's part number
* : Selected at factory

44W73714 | 8/8

Table 6-13 COMPONENT LIST OF PHASE DETECTOR (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 2	Elect,(CE04W1V220)	22μF,±20%,35V		
C 3	Elect,(CE04W1V220)	22μF,±20%,35V		
C 4	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 5	Plast,(ECQ-P1 332FZ)	3300pF,±1pF,50V		
C 6	Plast,(ECQ-P1 332FZ)	3300pF,±1pF,50V		
C 7	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 8	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 9	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 10	Cer,(CC924CH1H 100D)	10pF,±0.5pF,50V		
C 11	Elect,(CE04W1V220)	22μF,±20%,35V		
C 12	Elect,(CE04W1V220)	22μF,±20%,35V		
C 13	Elect,(CE04W1V220)	22μF,±20%,35V		
C 14	Elect,(CE04W1V220)	22μF,±20%,35V		
C 15	Cer,(RPE111CH911G50)	910pF,±2%,50V		
C 16	Elect,(CE04W1V220)	22μF,±20%,35V		
C 17	Elect,(CE04W1V220)	22μF,±20%,35V		
C 18	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 19	Elect,(CE04W1V220)	22μF,±20%,35V		
C 20	Not assigned			
C 21	Elect,(CE04W1V220)	22μF,±20%,35V		
C 22	Not assigned			
C 23	Tant,(CS02H1C3R3M)	3.3μF,±20%,16V		
C 24	Elect,(CE04W1V100)	10μF,±20%,35V		
C 25	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 26	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 27	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 28	Cer,(RPE111CH431G50)	430pF,±2%,50V		
C 29	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 30	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 31	Elect,(CE04W1A470)	47μF,±20%,10V		
C 32	Elect,(CE04W1A470)	47μF,±20%,10V		
C 33	Elect,(CE04W1E221)	220μF,±20%,25V		
C 34	Elect,(CE04W1V220)	22μF,±20%,35V		
C 35	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 36	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 37	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 38	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 39	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 40	Elect,(CE04W1V100)	10μF,±20%,35V		
C 41	Elect,(CE04W1V220)	22μF,±20%,35V		
C 42	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 43	Elect,(CE04W1V220)	22μF,±20%,35V		
C 44	Elect,(CE04W1V220)	22μF,±20%,35V		
C 45	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		

( ): Manufacturer's part number
* : Selected at factory

44W73715 | 1/12

Table 6-13 COMPONENT LIST OF PHASE DETECTOR (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
C 46	Plast,(ECQ-M1H 224KZ)	0.22μF,±10%,50V		
C 47	Tant,(CS02H1C151M)	150μF,±20%,50V		
C 48	Cer,(CC924CH1H680J)	68pF,±5%,50V		
C 49	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 50	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 51	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 52	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 53	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 54	Plast,(ECQ-P1-152FZ)	1500pF,±10%,50V		Q'ty 0 or 1
C 55	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 56	Elect,(CE04W1V220)	22μF,±20%,35V		
C 57	Elect,(CE04W1V220)	22μF,±20%,35V		
C 58	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 59	Elect,(CE04W1V100)	10μF,±20%,35V		
C 60	Elect,(CE04W1V220)	22μF,±20%,35V		
C 61	Elect,(CE04W1V220)	22μF,±20%,35V		
C 62	Elect,(CE04W1V220)	22μF,±20%,35V		
C 63	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 64	Var,cer,(TZ03R200A)	4 to 20pF,100V		
C 65	Cer,(CC924CH1H360J)	36pF,±5%,50V		
C 66	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 67	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 68	Elect,(CE04W1V220)	22μF,±20%,35V		
C 69	Elect,(CE04W1V220)	22μF,±20%,35V		
C 70	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 71	Elect,(CE04W1V220)	22μF,±20%,35V		
C 72	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 73	Elect,(CE04W1V220)	22μF,±20%,35V		
C 74	Not assigned			
C 75	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 76	Plast,(ECQ-P1 822FZ)	8200pF,±1pF,50V		
C 77	Plast,(ECQ-P1 302FZ)	3000pF,±1pF,50V		
C 78	Plast,(ECQ-P1 152FZ)	1500pF,±1pF,50V		
C 79	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C 80	Cer,(CE04W1A470)	47μF,±20%,10V		
C 81	Cer,(CC924CH1H151J)	150pF,±5%,50V		
C 82	Cer,(CC924CH1H151J)	150pF,±5%,50V		
C 83	Cer,(CC924CH1H820J)	82pF,±5%,50V		
C 84	Cer,(CC924CH1H680J)	68pF,±5%,50V		
C 85	Cer,(CC924CH1H330J)	33pF,±5%,50V		
C 86	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 87	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 88	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 89	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 90	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		

( ): Manufacturer's part number
* : Selected at factory

44W73715 | 2/12

Table 6-13 COMPONENT LIST OF PHASE DETECTOR (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
C 91	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 92	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 93	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 94	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 95	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 96	Not assigned			
C 97	Elect,(CE04W1E221)	220μF,±20%,25V		
C 98	Elect,(CE04W1V220)	22μF,±20%,35V		
C 99	Elect,(CE04W1V220)	22μF,±20%,35V		
C 100	Elect,(CE04W1E221)	220μF,±20%,25V		
C 101	Cer,(CK924C1H102M)	1000pF,±10%,50V		
C 102	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 103	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 104	Cer,(CC924CH1H050D)	5pF,±0.5pF,50V		
C 105	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 106	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 107	Cer,(CC924CH1H270J)	27pF,±5%,50V		
C 108	Cer,(CC924CH1H470J)	47pF,±5%,50V		
C 109	Cer,(CC924CH1H470J)	47pF,±5%,50V		
C 110	Elect,(CE04W1V220)	22μF,±20%,35V		
C 111	Elect,(CE04W1V220)	22μF,±20%,35V		
C 112	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 113	Not assigned			
C 114	Elect,(CE04W1V220)	22μF,±20%,35V		
C 115	Elect,(CE04W1V220)	22μF,±20%,35V		
C 116	Elect,(CE04W1V220)	22μF,±20%,35V		
C 117	Elect,(CE04W1V220)	22μF,±20%,35V		
C 118	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 119	Elect,(CE04W1V220)	22μF,±20%,35V		
C 120	Elect,(CE04W1V220)	22μF,±20%,35V		
C 121	Elect,(CE04W1V220)	22μF,±20%,35V		
C 122	Elect,(CE04W1V220)	22μF,±20%,35V		
C 123	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 124	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 125	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 126	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 127	Elect,(CE04W1V220)	22μF,±20%,35V		
C 128	Elect,(CE04W1V220)	22μF,±20%,35V		
C 129	Elect,(CE04W1V220)	22μF,±20%,35V		
C 130	Elect,(CE04W1V220)	22μF,±20%,35V		
C 131	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 132	Cer,(RPE111CH301G50)	300pF,±2%,50V		
C 133	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C 134	Elect,(CE04W1V220)	22μF,±20%,35V		
C 135	Elect,(CE04W1V220)	22μF,±20%,35V		
C 136	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 137	Not assigned			
C 138	Cer,(CE04W1V220)	22μF,±20%,35V		

( ): Manufacturer's part number
* : Selected at factory

Table 6-13 COMPONENT LIST OF PHASE DETECTOR (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
L 1	Var,coil,(LV2-221)	245μH		
L 2	Var,coil,(LV2-221)	245μH		
L 3	Var,coil,(LV1-220)	18μH		
L 4	Microinductor,(LF8-221K)	220μH		
L 5	Microinductor,(LF8-221K)	220μH		
L 6	Not assigned			
L 7	Microinductor,(LF8-221K)	220μH		
L 8	Microinductor,(LF8-221K)	220μH		
L 9	Coil,(FS0810S-102K)	1mH		
L 10	Not assigned			
L 11	Var,coil,(LV1-101)	100μH		
L 12	Var,coil,(LV1-101)	100μH		
L 13	Var,coil,(LV1-102)	1mH		
L 14	Coil,(LH1-332K)	3.3mH		
L 15	Microinductor,(LF8-221K)	220μH		
L 16	Microinductor,(LF8-221K)	220μH		
L 17	Coil,(LH1-222K)	2.2mH		
L 18	Not assigned			
L 19	Not assigned			
L 20	Not assigned			
L 21	Microinductor,(LF8-221K)	220μH		
L 22	Microinductor,(LF8-221K)	220μH		
L 23	Microinductor,(LF8-220K)	22μH		
L 24	Microinductor,(LF8-221K)	220μH		
L 25	Microinductor,(LF8-221K)	220μH		
L 26	Not assigned			
L 27	Not assigned			
L 28	Var,coil,(LV2-681)	680μH		
L 29	Var,coil,(LV2-221)	220μH		
L 30	Not assigned			
L 31	Var,coil,(LV2-101)	100μH		
L 32	Var,coil,(LV1-150)	15μH		
L 33	Var,coil,(LV1-100)	10μH		
L 34	Var,coil,(LV1-6R8)	6.8μH		
L 35	Var,coil,(LV1-6R8)	6.8μH		
L 36	Var,coil,(LV1-4R7)	4.7μH		
L 37	Var,coil,(LV1-3R3)	3.3μH		

( ): Manufacturer's part number
* : Selected at factory

Table 6-13 COMPONENT LIST OF PHASE DETECTOR (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
L 38	Not assigned			
L 39	Not assigned			
L 40	Not assigned			
L 41	Microinductor,(LF8-220K)	22μH		
L 42	Coil,(LH1-102K)	1mH		
L 43	Coil,(LH1-102K)	1mH		
L 44	Coil,(LH1-102K)	1mH		
L 45	Coil,(LH1-102K)	1mH		
L 46	Coil,(LH1-102K)	1mH		
L 47	Coil,(LH1-102K)	1mH		
L 48	Coil,(LH1-102K)	1mH		
L 49	Coil,(LH1-102K)	1mH		
L 50	Not assigned			
L 51	Microinductor,(LF8-221K)	220μH		
L 52	Microinductor,(LF8-221K)	220μH		
L 53	Microinductor,(LF8-221K)	220μH		
L 54	Microinductor,(LF8-221K)	220μH		
L 55	Microinductor,(LF8-220K)	22μH		
L 56	Coil,(FS0810S-471K)	470μH		
L 57	Coil,(FS0810S-152K)	1.5mH		
Q 1	Tr,Si,NPN,(2SC1834)			
Q 2	IC,(TC4053BP)			
Q 3	IC,(μA733C-N)			
Q 4	Tr,Si,NPN,(2SC1833)			
Q 5	Tr,Si,NPN,(2SC1833)			
Q 6	Tr,Si,NPN,(2SC1833)			
Q 7	Di,Si,(1S953)			
Q 8	Di,Si,(1S953)			
Q 9	J-FET,N ch,(2SK12)			
Q 10	Not assigned			
Q 11	IC,(74LS00)			
Q 12	IC,(μPC251C)			
Q 13	Tr,Si,NPN,(2SC1833)			
Q 14	Tr,Si,NPN,(2SC1833)			
Q 15	Tr,Si,NPN,(2SC1833)			
Q 16	Not assigned			
Q 17	IC,(74LS00)			
Q 18	IC,(74LS74A)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-13 COMPONENT LIST OF PHASE DETECTOR (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
Q 19	IC,(74LS74A)			
Q 20	Not assigned			
Q 21	Tr,Si,NPN,(2SC1833)			
Q 22	Tr,Si,NPN,(2SC1833)			
Q 23	Tr,Si,NPN,(2SC1833)			
Q 24	Tr,Si,NPN,(2SC1833)			
Q 25	Tr,Si,NPN,(2SC1833)			
Q 26	Tr,Si,NPN,(2SC1833)			
Q 27	Tr,Si,NPN,(2SC1833)			
Q 28	Tr,Si,NPN,(2SC1833)			
Q 29	IC,(74LS10)			
Q 30	Not assigned			
Q 31	Tr,Si,NPN,(2SC1833)			
Q 32	Tr,Si,NPN,(2SC1833)			
Q 33	IC,(μPC251C)			
Q 34	Di,Si,(1S953)			
Q 35	Tr,Si,NPN,(2SC1833)			
Q 36	Di,Si,(1S953)			
Q 37	Tr,Si,NPN,(2SC1833)			
Q 38	IC,(μPC251C)			
Q 39	IC,(TC4053BP)			
Q 40	Di,Si,(1S953)			
Q 41	Di,breakdown,(RD3.9EB)	3.7 to 4.1V,400mW		
Q 42	Di,Si,(1S953)			
Q 43	Tr,Si,NPN,(2SC1833)			
Q 44	Di,breakdown,(RD3.9EB)	3.7 to 4.1V,400mW		
Q 45	Di,Si,(1S953)			
Q 46	IC,(μPC251C)			
Q 47	Not assigned			
Q 48	Tr,Si,NPN,(2SC1834)			
Q 49	Tr,Si,NPN,(2SC1834)			
Q 50	Tr,Si,NPN,(2SC1834)			
Q 51	Di,varicap,(FC52M)			
Q 52	Not assigned			
Q 53	IC,(74LS90)			
Q 54	IC,(74LS90)			
Q 55	IC,(74LS92)			
Q 56	IC,(74LS92)			
Q 57	IC,(74LS93)			
Q 58	IC,(74LS90)			
Q 59	IC,(74LS151)			
Q 60	Di,Si,(1S953)			
Q 61	Tr,Si,NPN,(2SC1833)			
Q 62	Not assigned			
Q 63	Tr,Si,NPN,(2SC1833)			
Q 64	Tr,Si,NPN,(2SC1833)			
Q 65	Tr,Si,NPN,(2SC1834)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-13 COMPONENT LIST OF PHASE DETECTOR (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
Q 66	Tr,Si,NPN,(2SC1834)			
Q 67	Tr,Si,NPN,(2SC1252)			
Q 68	Di,Si,(1S953)			
Q 69	Di,Si,(1S953)			
Q 70	Di,Si,(1S953)			
Q 71	Di,Si,(1S953)			
Q 72	Di,Si,(1S953)			
Q 73	Di,Si,(1S953)			
Q 74	Di,Si,(1S953)			
Q 75	Di,Si,(1S953)			
Q 76	Di,Si,(1S953)			
Q 77	IC,(μPA67C)			
Q 78	IC,(μPA67C)			
Q 79	Tr,Si,NPN,(2SC1833)			
Q 80	Di,Si,(1S953)			
Q 81	IC,(74LS04)			
Q 82	IC,(74LS04)			
Q 83	IC,(74LS10)			
Q 84	IC,(7406)			
Q 85	Not assigned			
Q 86	Di,Si,(1S953)			
Q 87	Di,breakdown,(RD13EB)	12.4 to 14.1V,400mW		
Q 88	IC,(74LS147)			
Q 89	Not assigned			
Q 90	Not assigned			
Q 91	Tr,Si,NPN,(2SC1834)			
Q 92	Tr,Si,NPN,(2SC1834)			
Q 93	Di,varicap,(FC52M)			
Q 94	Di,Si,(1S953)			
Q 95	Di,Si,(1S953)			
Q 96	Di,Si,(1S953)			
Q 97	Tr,Si,NPN,(2SC1834)			
Q 98	Tr,Si,NPN,(2SC1834)			
Q 99	Di,varicap,(FC52M)			
Q 100	Not assigned			
Q 101	Di,Si,(1S953)			
Q 102	Di,Si,(1S953)			
Q 103	Di,Si,(1S953)			
Q 104	Not assigned			
Q 105	Not assigned			
Q 106	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 107	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 108	IC,(μPC14305H)			
Q 109	Di,Si,(1S953)			
Q 110	IC,(μPC151C)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-13 COMPONENT LIST OF PHASE DETECTOR (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
Q 111	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 112	Tr,Si,NPN,(2SC1834)			
Q 113	Tr,Si,NPN,(2SC1834)			
Q 114	Tr,Si,NPN,(2SC1252)			
R 1	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 2	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 3	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 4	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 5	CF,(ARD25T560J)	56Ω,±5%,1/4W		
R 6	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 7	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 8	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 9	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 10	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 11	Not assigned			
R 12	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 13	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 14	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 15	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 16	MF,(RN14K2E11R0D)	11Ω,±0.5%,1/4W		
R 17	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 18	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 19	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 20	Not assigned			
R 21	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 22	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 23	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 24	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 25	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 26	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 27	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 28	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 29	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 30	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 31	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 32	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 33	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 34	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 35	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 36	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 37	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 38	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 39	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 40	CF,(ARD25T102J)	1kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-13 COMPONENT LIST OF PHASE DETECTOR (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
R 41	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 42	CF,(ARD25T601J)	600Ω,±5%,1/4W		
R 43	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 44	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 45	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 46	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 47	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 48	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 49	Not assigned			
R 50	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R 51	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 52	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 53	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R 54	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 55	Not assigned			
R 56	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 57	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 58	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 59	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 60	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 61	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 62	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 63	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 64	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 65	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 66	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 67	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 68	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 69	Var,MF,(RJ6S 5kΩ)	5kΩ,1/2W		
R 70	Var,MF,(RJ6S 5kΩ)	5kΩ,1/2W		
R 71	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 72	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R 73	CF,(ARD25T393J)	39kΩ,±5%,1/4W		
R 74	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 75	CF,(ARD25T474J)	470kΩ,±5%,1/4W		
R 76	CF,(ARD25T474J)	470kΩ,±5%,1/4W		
R 77	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 78	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 79	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 80	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 81	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 82	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 83	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 84	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 85	CF,(ARD25T271J)	270Ω,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-13 COMPONENT LIST OF PHASE DETECTOR (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
R 86	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 87	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 88	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 89	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 90	CF,(ARD25T154J)	150kΩ,±5%,1/4W		
R 91	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 92	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		
R 93	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 94	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 95	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 96	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 97	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 98	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 99	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 100	Not assigned			
R 101	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 102	Not assigned			
R 103	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 104	CF,(ARD25T154J)	150kΩ,±5%,1/4W		
R 105	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 106	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 107	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 108	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 109	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 110	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 111	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 112	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 113	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 114	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 115	Not assigned			
R 116	Not assigned			
R 117	Not assigned			
R 118	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 119	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 120	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 121	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 122	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 123	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 124	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 125	MF,(RN14K2H331J)	330Ω,±5%,1/2W		
R 126	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 127	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 128	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 129	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 130	CF,(ARD25T102J)	1kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-13 COMPONENT LIST OF PHASE DETECTOR (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
* R 131	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 132	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 133	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 134	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 135	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
* R 136	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
* R 137	Not assigned			
R 138	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 139	Not assigned			
R 140	Not assigned			
R 141	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 142	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 143	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 144	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 145	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 146	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 147	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 148	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
* R 149	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
* R 150	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 151	Not assigned			
R 152	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
* R 153	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 154	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 155	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
* R 156	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 157	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
* R 158	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
* R 159	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
* R 160	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 161	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
* R 162	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R 163	Not assigned			
R 164	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
* R 165	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 166	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 167	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 168	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 169	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 170	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 171	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 172	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 173	CF,(ARD25T181J)	180Ω,±5%,1/4W		
* R 174	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
* R 175	CF,(ARD25T181J)	180Ω,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

44W73715 11/12

Table 6-13 COMPONENT LIST OF PHASE DETECTOR (Z2)

CKT REF	DESCRIPTION	RATING		NOTE
R 176	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 177	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 178	CF,(ARD25T220J)	22Ω,±5%,1/4W		
R 179	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 180	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 181	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 182	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 183	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 184	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 185	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 186	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 187	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 188	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 189	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 190	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 191	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 192	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 193	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 194	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 195	MF,(RN14K2H331J)	330Ω,±5%,1/2W		
R 196	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 197	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 198	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
S 1	Switch,(DIP-A(4))			
X 1	XTAL OSC,(44X64089A)	1,722.222kHz		A type
	XTAL OSC,(44X64089C)	2,122.222kHz		B type
	XTAL OSC,(44X64089C)	2,122.222kHz		C type
X 2	XTAL OSC,(44X64089E)	3,302.222kHz		
X 3	XTAL OSC,(44X64089G)	4,152.222kHz		
X 4	XTAL OSC,(44X64089J)	5,322.222kHz		
X 5	XTAL OSC,(44X64089L)	7,922.222kHz		
X 6	XTAL OSC,(44X64089N)	12,112.222kHz		
X 7	XTAL OSC,(44X64090)	20MHz		
Z 1	Mixer,(R&K M7(8 pin) D.B.M.)			

( ): Manufacturer's part number
* : Selected at factory

44W73715 12/12

Table 6-14 COMPONENT LIST OF BB DETECTOR (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 2	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 3	Elect,(CE04W1V220)	22μF,±20%,35V		
C 4	Plast,(ECQ-M1H 224KZ)	0.22μF,±10%,50V		
C 5	Cer,(CK924C1H104M)	0.1μF,±20%,50V		Q'ty 2, Parallel
C 6	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 7	Not assigned			
C 8	Cer,(RPE111CH201G50)	200pF,±2%,50V		
C 9	Cer,(CC924CH1H090D)	9pF,±0.5pF,50V		
C 10	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 11	Not assigned			
C 12	Not assigned			
C 13	Not assigned			
C 14	Tant,(CS02H1C3R3M)	3.3μF,±20%,16V		
C 15	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 16	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 17	Tant,(CS02H1C3R3M)	3.3μF,±20%,16V		
C 18	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 19	Elect,(CE04W1V220)	22μF,±20%,35V		
C 20	Elect,(CE04W1V100)	10μF,±20%,35V		
C 21	Elect,(CE04W1V220)	22μF,±20%,35V		
C 22	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 23	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 24	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 25	Elect,(CE04W1V100)	10μF,±20%,35V		
C 26	Tant,(CS02H1C3R3M)	3.3μF,±20%,16V		
C 27	Plast,(ECQ-M1H 332KZ)	3300pF,±10%,50V		
C 28	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 29	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 30	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 31	Not assigned			
C 32	Not assigned			
C 33	Elect,(CE04W1V220)	22μF,±20%,35V		
C 34	Elect,(CE04W1V220)	22μF,±20%,35V		
C 35	Elect,(CE04W1V220)	22μF,±20%,35V		
C 36	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 37	Not assigned			
C 38	Cer,(CK924C1H104M)	0.1μF,±20%,50V		Q'ty 0 to 2
C 39	Cer,(CK924C1H104M)	0.1μF,±20%,50V		Q'ty 0 or 1
C 40	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 41	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 42	Elect,(CE04W1V220)	22μF,±20%,35V		
C 43	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 44	Not assigned			
C 45	Elect,(CE04W1V220)	22μF,±20%,35V		

( ): Manufacturer's part number
* : Selected at factory

44W73716 1/12

Table 6-14 COMPONENT LIST OF BB DETECTOR (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
C 46	Elect,(CE04W1V220)	22μF,±20%,35V		
C 47	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 48	Elect,(CE04W1V220)	22μF,±20%,35V		
C 49	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 50	Elect,(CE04W1V220)	22μF,±20%,35V		
C 51	Elect,(CE04W1V220)	22μF,±20%,35V		
C 52	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 53	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 54	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 55	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 56	Elect,(CE04W1V220)	22μF,±20%,35V		
C 57	Elect,(CE04W1V220)	22μF,±20%,35V		
C 58	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 59	Not assigned			
C 60	Cer,(CC924CH1H330J)	33pF,±5%,50V		
C 61	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 62	Cer,(CC924CH1H330J)	33pF,±5%,50V		
C 63	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 64	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 65	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 66	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C 67	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 68	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 69	Plast,(ECQ-P1 332FZ)	3300pF,±1%,100V		
C 70	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 71	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 72	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 73	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 74	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 75	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 76	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 77	Elect,(CE04W1J1R0)	1μF,±20%,63V		
C 78	Cer,(CC924CH1H151J)	150pF,±5%,50V		
C 79	Cer,(CC924CH1H221J)	220pF,±5%,50V		
C 80	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 81	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 82	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 83	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 84	Elect,(CE04W1V220)	22μF,±20%,35V		
C 85	Elect,(CE04W1V220)	22μF,±20%,35V		
C 86	Elect,(CE04W1V220)	22μF,±20%,35V		
C 87	Elect,(CE04W1V220)	22μF,±20%,35V		
C 88	Cer,(CC924CH1H470J)	47pF,±5%,50V		
C 89	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C 90	Cer,(CC924CH1H680J)	68pF,±5%,50V		

( ): Manufacturer's part number
* : Selected at factory

44W73716 2/12

Table 6-14 COMPONENT LIST OF BB DETECTOR (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
C 91	Cer,(CC924CH1H221J)	220pF,±5%,50V		
C 92	Cer,(CC924CH1H220J)	22pF,±5%,50V		
C 93	Tant,(CS02H1C3R3M)	3.3μF,±20%,16V		
C 94	Tant,(CS02H1C3R3M)	3.3μF,±20%,16V		
C 95	Elect,(CE04W1V220)	22μF,±20%,35V		
C 96	Elect,(CE04W1V220)	22μF,±20%,35V		
C 97	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 98	Cer,(CK924C1H104J)	0.1μF,±5%,50V		
C 99	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 100	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 101	Elect,(CE04W1E101)	100μF,±20%,25V		
C 102	Elect,(CE04W1J1R0)	1μF,±20%,63V		
C 103	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 104	Elect,(CE04W1E101)	100μF,±20%,25V		
C 105	Elect,(CE04W1V220)	22μF,±20%,35V		
C 106	Elect,(CE04W1V220)	22μF,±20%,35V		
C 107	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 108	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 109	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 110	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 111	Plast,(ECQ-M1H 333KZ)	0.033μF,±10%,50V		
C 112	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 113	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 114	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 115	Elect,(CE04W1J010)	1μF,±20%,63V		
C 116	Cer,(CK924C1H104M)	0.1μF,±5%,50V		
C 117	Cer,(CK924C1H104M)	0.1μF,±5%,50V		
C 118	Cer,(CK924C1H104M)	0.1μF,±5%,50V		
C 119	Cer,(CC924CH1H470J)	47pF,±5%,50V		
J 1	Produced by pattern			
J 2	Receptacle,(BNC-R-NI)			
J *	Connector,(PI021-2M)			
K 1	Relay,(NRS-12V)			
K 2	Relay,(NF2E-12V)			
K 3	Relay,(NF2E-12V)			
K 4	Relay,(NF2E-12V)			
K 5	Relay,(NF2E-12V)			
K 6	Relay,(NF2E-12V)			
K 7	Relay,(NF2E-12V)			
K 8	Relay,(NF2E-12V)			
K 9	Relay,(NF2E-12V)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-14 COMPONENT LIST OF BB DETECTOR (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
L 1	Microinductor,(LF8-221K)	220μH		
L 2	Microinductor,(LF8-221K)	220μH		
L 3	Microinductor,(LF8-221K)	220μH		
L 4	Microinductor,(LF8-221K)	220μH		
L 5	Coil,(FS1215-333K)	33mH		
L 6	Coil,(FS1215-333K)	33mH		
L 7	Coil,(FS0810-331K)	330μH		
L 8	Microinductor,(LF8-220K)	22μH		
L 9	Not assigned			
L 10	Microinductor,(LF8-221K)	220μH		
L 11	Microinductor,(LF8-221K)	220μH		
L 12	Microinductor,(LF8-221K)	220μH		
L 13	Microinductor,(LF8-221K)	220μH		
L 14	Coil,(LH1-223K)	22mH		
L 15	Not assigned			
L 16	Microinductor,(LF8-221K)	220μH		
L 17	Microinductor,(LF8-221K)	220μH		
L 18	Var,coil,(LV1-4R7)	4.7μH		
L 19	Var,coil,(LV1-6R8)	6.8μH		
L 20	Var,coil,(LV1-330)	33μH		
L 21	Var,coil,(LV1-680)	68μH		
L 22	Var,coil,(LV2-331)	330μH		
L 23	Var,coil,(LV2-681)	680μH		
L 24	Var,coil,(LV2-152)	1.5mH		
L 25	Coil,(LH1-333K)	33mH		
L 26	Coil,(LH1-333K)	33mH		
L 27	Not assigned			
L 28	Coil,(339T20195E)	1μH		
L 29	Coil,(339T20195G)	1.5μH		
L 30	Microinductor,(LF8-221K)	220μH		
L 31	Microinductor,(LF8-221K)	220μH		
L 32	Microinductor,(LF8-221K)	220μH		
L 33	Microinductor,(LF8-221K)	220μH		
L 34	Coil,(FS0810S-102K)	1mH		
L 35	Var,coil,(LV1-010)	1μH		

( ): Manufacturer's part number
* : Selected at factory

Table 6-14 COMPONENT LIST OF BB DETECTOR (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
L 36	Var,coil,(LV1-010)	1μH		
L 37	Microinductor, (SP0408-3R3)	3.3μH		
Q 1	IC,(μPC151C)			
Q 2	Di,Si,(1S953)			
Q 3	Di,Si,(1S953)			
Q 4	Di,Si,(1S953)			
Q 5	Di,Si,(1S953)			
Q 6	Di,Si,(1S953)			
Q 7	Di,Si,(1S953)			
Q 8	Di,Si,(1S953)			
Q 9	Di,Si,(1S953)			
Q 10	Not assigned			
Q 11	IC,(7406)			
Q 12	IC,(7406)			
Q 13	Tr,Si,NPN,(2SC1254)			
Q 14	Not assigned			
Q 15	Tr,Si,NPN,(2SC1254)			
Q 16	Tr,Si,NPN,(2SC1254)			
Q 17	Tr,Si,NPN,(2SC1254)			
Q 18	Tr,Si,NPN,(2SC1834)			
Q 19	Di,Si,(1SS97)			
Q 20	Di,Si,(1SS97)			
Q 21	IC,(μPC251C)			
Q 22	Di,Si,(1S953)			
Q 23	Di,Si,(1SS97)			
Q 24	Di,Si,(1SS97)			
Q 25	Di,Si,(1SS97)			
Q 26	Di,Si,(1SS97)			
Q 27	IC,(μPC251C)			
Q 28	IC,(μPC251C)			
Q 29	Di,Si,(1S953)			
Q 30	Not assigned			
Q 31	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 32	IC,(μPC251C)			
Q 33	Di,Si,(1S953)			
Q 34	J-FET,N ch,(3SK28)			
Q 35	Tr,Si,NPN,(2SC1833)			
Q 36	IC,(TC4053BP)			
Q 37	Di,Si,(1S953)			
Q 38	Not assigned			
Q 39	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 40	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		

( ): Manufacturer's part number
* : Selected at factory

Table 6-14 COMPONENT LIST OF BB DETECTOR (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
Q 41	Not assigned			
Q 42	Not assigned			
Q 43	Not assigned			
Q 44	Not assigned			
Q 45	Di,Si,(1S953)			
Q 46	Tr,Si,NPN,(2SC1833)			
Q 47	Di,Si,(1S953)			
Q 48	IC,(UA733CN)			
Q 49	Tr,Si,NPN,(2SC1834)			
Q 50	Not assigned			
Q 51	Not assigned			
Q 52	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 53	Tr,Si,NPN,(2SC1254)			
Q 54	IC,(74LS73)			
Q 55	IC,(HD74121)			
Q 56	Tr,Si,PNP,(2SA883)			
Q 57	Tr,Si,PNP,(2SA883)			
Q 58	Tr,Si,PNP,(2SA883)			
Q 59	Not assigned			
Q 60	IC,(μPC251C)			
Q 61	Di,breakdown,(RD3.9EB)	3.7 to 4.1V,400mW		
Q 62	IC,(μPC251C)			
Q 63	IC,(TL441C)			
Q 64	IC,(μPC251C)			
Q 65	IC,(μPC251C)			
Q 66	Not assigned			
Q 67	Not assigned			
Q 68	Not assigned			
Q 69	Not assigned			
Q 70	Di,Si,(1S953)			
Q 71	Di,Si,(1S953)			
Q 72	Di,Si,(1S953)			
Q 73	Di,Si,(1S953)			
Q 74	Di,Si,(1S953)			
Q 75	Di,Si,(1S953)			
Q 76	Di,Si,(1S953)			
Q 77	IC,(μPC251C)			
Q 78	IC,(TC4053BP)			
Q 79	Tr,Si,NPN,(2SC1254)			
Q 80	Tr,Si,NPN,(2SC1254)			
Q 81	Not assigned			
Q 82	Not assigned			
Q 83	IC,(74LS14)			
Q 84	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 85	IC,(TC4053BP)			BB AMPL Option
Q 86	IC,(μPC16308H)			
Q 87	IC,(μPC14308H)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-14 COMPONENT LIST OF BB DETECTOR (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
R 1	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 2	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 3	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 4	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 5	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 6	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 7	Not assigned			
R 8	Not assigned			
R 9	Not assigned			
R 10	MF,(RN14K2E2670D)	267Ω,±0.5%,1/4W		
R 11	MF,(RN14K2E2670D)	267Ω,±0.5%,1/4W		
R 12	MF,(NRN1/4C4 45.3ΩD)	45.3Ω,±0.5%,1/4W		
R 13	MF,(NRN1/4C4 1.30kΩF)	1.30kΩ,±1%,1/4W		
R 14	MF,(NRN1/4C4 1.30kΩF)	1.30kΩ,±1%,1/4W		
R 15	MF,(NRN1/4C4 8.66ΩF)	8.66Ω,±1%,1/4W		
R 16	MF,(NRN1/4C4 654ΩD)	654Ω,±0.5%,1/4W		
R 17	MF,(NRN1/4C4 654ΩD)	654Ω,±0.5%,1/4W		
R 18	MF,(NRN1/4C4 17.4ΩD)	17.4Ω,±0.5%,1/4W		
R 19	MF,(RN14K2E3320D)	332Ω,±0.5%,1/4W		
R 20	MF,(RN14K2E3320D)	332Ω,±0.5%,1/4W		
R 21	MF,(NRN1/4C4 35.7ΩD)	35.7Ω,±0.5%,1/4W		
R 22	MF,(RN14K2E1740D)	174Ω,±0.5%,1/4W		
R 23	MF,(RN14K2E1740D)	174Ω,±0.5%,1/4W		
R 24	MF,(NRN1/4C4 79.3ΩD)	79.3Ω,±0.5%,1/4W		
R 25	MF,(NRN1/4C4 103.3ΩD)	103.3Ω,±0.5%,1/4W		
R 26	MF,(NRN1/4C4 103.3ΩD)	103.3Ω,±0.5%,1/4W		
R 27	MF,(NRN1/4C4 231ΩD)	231Ω,±0.5%,1/4W		
R 28	MF,(NRN1/4C4 103.3ΩD)	103.3Ω,±0.5%,1/4W		
R 29	MF,(NRN1/4C4 103.3ΩD)	103.3Ω,±0.5%,1/4W		
R 30	MF,(NRN1/4C4 231ΩD)	231Ω,±0.5%,1/4W		
R 31	MF,(NRN1/4C4 103.3ΩD)	103.3Ω,±0.5%,1/4W		
R 32	MF,(NRN1/4C4 103.3ΩD)	103.3Ω,±0.5%,1/4W		
R 33	MF,(NRN1/4C4 231ΩD)	231Ω,±0.5%,1/4W		
R 34	Not assigned			
R 35	Not assigned			
R 36	Not assigned			
R 37	Not assigned			
R 38	Not assigned			
R 39	Not assigned			
R 40	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R 41	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 42	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R 43	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		
R 44	MF,(RN14K2E1431D)	1.43kΩ,±0.5%,1/4W		
R 45	MF,(NRN1/4C4 292ΩD)	2.9kΩ,±0.5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-14 COMPONENT LIST OF BB DETECTOR (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
R 46	MF,(NRN1/4C4 107.4ΩD)	107.4Ω,±0.5%,1/4W		
R 47	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 48	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 49	Var,MF,(RJ-6P 500Ω)	500Ω,1/2W		
R 50	Not assigned			
R 51	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 52	Not assigned			
R 53	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 54	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 55	CF,(ARD25T131J)	130Ω,±5%,1/4W		
R 56	Not assigned			
R 57	Not assigned			
R 58	Not assigned			
R 59	Not assigned			
R 60	Not assigned			
R 61	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 62	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 63	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 64	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 65	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 66	Not assigned			
R 67	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 68	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 69	Not assigned			
R 70	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 71	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 72	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 73	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 74	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 75	CF,(ARD25T131J)	130Ω,±5%,1/4W		
R 76	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R 77	CF,(ARD25T131J)	130Ω,±5%,1/4W		
R 78	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 79	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 80	CF,(ARD25T183J)	18kΩ,±5%,1/4W		
R 81	CF,(ARD25T330J)	33Ω,±5%,1/4W		
R 82	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 83	Not assigned			
R 84	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 85	Not assigned			
R 86	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 87	CF,(ARD25T474J)	470kΩ,±5%,1/4W		
R 88	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 89	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 90	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-14 COMPONENT LIST OF BB DETECTOR (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
R 91	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 92	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 93	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 94	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 95	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 96	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 97	CF,(ARD25T183J)	18kΩ,±5%,1/4W		
R 98	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 99	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 100	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 101	Not assigned			
R 102	Not assigned			
R 103	Not assigned			
R 104	Not assigned			
R 105	Not assigned			
R 106	Not assigned			
R 107	Not assigned			
R 108	Not assigned			
R 109	Not assigned			
R 110	MF,(RN14K2E2321D)	2.32kΩ,±0.5%,1/4W		
R 111	Not assigned			
R 112	MF,(RN14K2E8660D)	866Ω,±0.5%,1/4W		
R 113	CF,(ARD25T203J)	20kΩ,±5%,1/4W		
R 114	Not assigned			
R 115	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R 116	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 117	MF,(RN14K2E4221D)	4.22kΩ,±0.5%,1/4W		
R 118	MF,(RN14K2E4221D)	4.22kΩ,±0.5%,1/4W		
R 119	MF,(RN14K2E2321D)	2.32kΩ,±0.5%,1/4W		
R 120	CF,(ARD25T*J)	10Ω to 1.2kΩ,±5%,1/4W		*0 short
R 121	MF,(RN14K2E1782D)	17.8kΩ,±0.5%,1/4W		
R 122	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 123	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 124	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 125	Not assigned			
R 126	Not assigned			
R 127	Not assigned			
R 128	Not assigned			
R 129	Not assigned			
R 130	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 131	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 132	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 133	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 134	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 135	CF,(ARD25T681J)	680Ω,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-14 COMPONENT LIST OF BB DETECTOR (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
R 136	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 137	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R 138	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 139	Not assigned			
R 140	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 141	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 142	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 143	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 144	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 145	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 146	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 147	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 148	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R 149	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 150	Not assigned			
R 151	Not assigned			
R 152	Not assigned			
R 153	Not assigned			
R 154	Not assigned			
R 155	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 156	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 157	Not assigned			
R 158	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 159	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 160	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 161	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R 162	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 163	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 164	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 165	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 166	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 167	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 168	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 169	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 170	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 171	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 172	Not assigned			
R 173	Not assigned			
R 174	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 175	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 176	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 177	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 178	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 179	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R 180	CF,(ARD25T473J)	47kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-14 COMPONENT LIST OF BB DETECTOR (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
R 181	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 182	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 183	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 184	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 185	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 186	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 187	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 188	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 189	Not assigned			
R 190	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 191	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 192	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 193	Not assigned			
R 194	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 195	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 196	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 197	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 198	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 199	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 200	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 201	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 202	MF,(RN14K2E4421D)	4.42kΩ,±0.5%,1/4W		
R 203	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R 204	Thermister,(OS-D5-300-1)			
R 205	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 206	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 207	Not assigned			
R 208	CF,(ARD25T822J)	8.2kΩ,±5%,1/4W		
R 209	CF,(ARD25T330J)	33Ω,±5%,1/4W		
R 210	CF,(ARD25T330J)	33Ω,±5%,1/4W		
R 211	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 212	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 213	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 214	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 215	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 216	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 217	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 218	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 219	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R 220	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 221	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 222	Not assigned			
R 223	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 224	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 225	Var,MF,(RJ-6P 50kΩ)	50kΩ,1/2W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-14 COMPONENT LIST OF BB DETECTOR (Z3)

CKT REF	DESCRIPTION	RATING		NOTE
R 226	CF,(ARD25T474J)	470kΩ,±5%,1/4W		
R 227	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 228	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 229	Not assigned			
R 230	Not assigned			
R 231	Not assigned			
R 232	Not assigned			
R 233	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 234	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 235	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 236	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 237	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 238	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R 239	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 240	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R 241	CF,(ARD25T474J)	470kΩ,±5%,1/4W		
R 242	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 243	CF,(ARD25T121J)	120Ω,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-15 COMPONENT LIST OF DISCRIMINATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 2	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 3	Cer,(CC924CH1H750J)	75pF,±5%,50V		
C 4	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 5	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 6	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 7	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 8	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 9	Not assigned			
C 10	Not assigned			
C 11	Cer,(CC924CH1H220J)	22pF,±5%,50V		
C 12	Cer,(CC924CH1H100D)	10pF,±0.5pF,50V		
C 13	Cer,(CC924CH1H100D)	10pF,±0.5pF,50V		
C 14	Cer,(CC924CH1H220J)	22pF,±5%,50V		
C 15	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 16	Elect,(CE04W1V100)	10μF,±20%,35V		
C 17	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 18	Elect,(CE04W1V100)	10μF,±20%,35V		
C 19	Elect,(CE04W1J1R0)	1μF,±20%,63V		
C 20	Not assigned			
C 21	Cer,(CC924CH1H820J)	82pF,±5%,50V		
C 22	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 23	Cer,(RPE111CH271G50)	270pF,±2%,50V		
C 24	Cer,(CC924CH1H151J)	150pF,±5%,50V		
C 25	Cer,(RPE111CH361G50)	360pF,±2%,50V		
C 26	Cer,(CC924CH1H560J)	56pF,±5%,50V		
C 27	Cer,(RPE111CH241G50)	240pF,±2%,50V		
C 28	Not assigned			
C 29	Not assigned			
C 30	Elect,(CE04W1J010)	1μF,±20%,63V		
C 31	Elect,(CE04W1V100)	10μF,±20%,35V		
C 32	Plast,(ECQ-P1 273FZ)	0.027μF,±1%,100V		A type
	Plast,(ECQ-P1 153FZ)	0.015μF,±1%,100V		B type
	Plast,(ECQ-P1 183FZ)	0.018μF,±1%,100V		C type
C 33	Plast,(ECQ-P1 272FZ)	2700pF,±1%,100V		A type
	Plast,(ECQ-P1 152FZ)	1500pF,±1%,100V		B type
	Plast,(ECQ-P1 182FZ)	1800pF,±1%,100V		C type
C 34	Plast,(ECQ-P1 132FZ)	1300pF,±1%,50V		A type
	Cer,(RPE111CH821G50)	820pF,±2%,50V		B type
	Plast,(ECQ-M1H102KZ)	1000pF,±10%,50V		C type
C 35	Cer,(CC924CH1H680J)	68pF,±5%,50V		A type
	Cer,(CC924CH1H470J)	47pF,±5%,50V		B type
	Cer,(CC924CH1H560J)	56pF,±5%,50V		C type
C 36	Cer,(CC924CH1H910J)	91pF,±5%,50V		
C 37	Cer,(CC924CH1H510J)	51pF,±5%,50V		
C 38	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 39	Cer,(CC924CH1H390J)	39pF,±5%,50V		
C 40	Elect,(CE04W1J1R0)	1μF,±20%,63V		

( ): Manufacturer's part number
* : Selected at factory

Table 6-15 COMPONENT LIST OF DISCRIMINATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
C 41	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 42	Elect,(CE04W1V100)	10μF,±20%,35V		
C 43	Elect,(CE04W1J010)	1μF,±20%,63V		
C 44	Cer,(RPE111CH131G50)	130pF,±2%,50V		
C 45	Cer,(CC924CH1H360J)	36pF,±5%,50V		
C 46	Cer,(CC924CH1H620J)	62pF,±5%,50V		
C 47	Cer,(RPE111CH121G50)	120pF,±2%,50V		
C 48	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 49	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 50	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 51	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 52	Elect,(CE04W1J010)	1μF,±20%,63V		
C 53	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 54	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 55	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 56	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 57	Elect,(CE04W1E470)	47μF,±20%,25V		
C 58	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 59	Elect,(CE04W1J1R0)	1μF,±20%,63V		
C 60	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 61	Elect,(CE04W1E101)	100μF,±20%,25V		
C 62	Elect,(CE04W1E221)	220μF,±20%,25V		
C 63	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 64	Not assigned			
C 65	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 66	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 67	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 68	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 69	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 70	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 71	Elect,(CE04W1V100)	10μF,±20%,35V		
C 72	Elect,(CE04W1V100)	10μF,±20%,35V		
C 73	Elect,(CE04W1J1R0)	1μF,±20%,63V		
C 74	Not assigned			
C 75	Not assigned			
C 76	Not assigned			
C 77	Not assigned			
C 78	Not assigned			
C 79	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 80	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 81	Elect,(CE04W1V100)	10μF,±20%,35V		
C 82	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 83	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 84	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 85	Cer,(CK924C1H472M)	4700pF,±20%,50V		

( ): Manufacturer's part number
* : Selected at factory

Table 6-15 COMPONENT LIST OF DISCRIMINATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
C 86	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 87	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 88	Elect,(CE04W1A470)	47μF,±20%,10V		
C 89	Cer,(CC924CH1H221J)	220pF,±5%,50V		
C 90	Cer,(CC924UH1H220JY)	22pF,±5%,50V		
C 91	Elect,(CE04W1E470)	47μF,±20%,25V		
C 92	Plast,(ECQ-P1 152FZ)	1500pF,±1%,100V		
C 93	Cer,(RPE111CH681G50)	680pF,±2%,50V		
C 94	Plast,(ECQ-P1 152FZ)	1500pF,±1%,100V		
C 95	Plast,(ECQ-P1 222FZ)	2200pF,±1%,100V		A type
	Plast,(ECQ-P1 102FZ)	1000pF,±1%,100V		B type
	Plast,(ECQ-P1 102FZ)	1000pF,±1%,100V		C type
C 96	Cer,(RPE111CH391G50)	390pF,±2%,50V		A type
	Cer,(RPE111CH391G50)	390pF,±2%,50V		B type
	Cer,(RPE111CH821G50)	820pF,±2%,50V		C type
C 97	Elect,(CE04W1V4R7)	4.7μF,±20%,35V		
C 98	Elect,(CE04W1V4R7)	4.7μF,±20%,35V		
C 99	Elect,(CE04W1E470)	47μF,±20%,25V		
C 100	Elect,(CE04W1E470)	47μF,±20%,25V		
C 101	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 102	Cer,(CC924CH1H220J)	22pF,±5%,50V		
C 103	Cer,(RPE111CH131G50)	130pF,±5%,50V		
C 104	Elect,(CE04W1A470)	47μF,±20%,10V		
C 105	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 106	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 107	Not assigned			
C 108	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 109	Not assigned			
C 110	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 111	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 112	Not assigned			
C 113	Not assigned			
C 114	Not assigned			
C 115	Not assigned			
C 116	Not assigned			
C 117	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 118	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 119	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 120	Elect,(CE04W1A470)	47μF,±20%,10A		
C 121	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 122	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 123	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 124	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 125	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 126	Cer,(RPE114CH105K50)	1μF,±10%,50V		
C 127	Elect,(CE04W1V220)	22μF,±20%,35V		
C 128	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		

( ): Manufacturer's part number

* : Selected at factory

44W73717 3/12

Table 6-15 COMPONENT LIST OF DISCRIMINATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
C 129	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 130	Elect,(CE04W1V100)	10μF,±20%,35V		
C 131	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 132	Elect,(CE04W1A101)	100μF,±20%,10V		
C 133	Elect,(CE04W1A101)	100μF,±20%,10V		
C 134	Elect,(CE04W1A470)	47μF,±20%,10V		
C 135	Elect,(CE04W1A470)	47μF,±20%,10V		
C 136	Elect,(CE04W1V100)	10μF,±20%,35V		
C 137	Elect,(CE04W1V100)	10μF,±20%,35V		
C 138	Elect,(CE04W1V100)	10μF,±20%,35V		
C 139	Elect,(CE04W1V100)	10μF,±20%,35V		
C 140	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 141	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 142	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 143	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 144	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 145	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 146	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 147	Cer,(RPE111CH111G50)	110pF,±2%,50V		
C 148	Cer,(CC924CH1H910J)	91pF,±5%,50V		
C 149	Cer,(CC924CH1H910J)	91pF,±5%,50V		
C 150	Elect,(CE04W1A470)	47μF,±20%,10V		
C 151	Elect,(CE04W1A470)	47μF,±20%,10V		
C 152	Elect,(CE04W1A470)	47μF,±20%,10V		
C 153	Elect,(CE04W1A470)	47μF,±20%,10V		
C 154	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 155	Elect,(CE04W1V220)	22μF,±20%,35V		
C 156	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 157	Plast,(ECQ-M1H222KZ)	2200pF,±10%,50V		Q'ty 0 or 1
C 158	Plast,(ECQ-M1H102KZ)	1000pF,±10%,50V		
C 159	Plast,(ECQ-M1H102KZ)	1000pF,±10%,50V		
C 160	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
L 1	Microinductor,(LF8-470K)	47μH		
L 2	Microinductor,(LF8-470K)	47μH		
L 3	Var,coil,(LV1-1R0)	1μH		
L 4	Var,coil,(LV1-330)	33μH		
L 5	Var,coil,(LV1-1R5)	1.5μH		
L 6	Microinductor,(LF8-221K)	220μH		
L 7	Coil,(339T20195A)			
L 8	Var,coil,(LV1-1R5)	1.5μH		
L 9	Var,coil,(LV1-1R5)	1.5μH		
L 10	Not assigned			
L 11	Not assigned			
L 12	Microinductor,(LF8-221K)	220μH		

( ): Manufacturer's part number

* : Selected at factory

44W73717 4/12

Table 6-15 COMPONENT LIST OF DISCRIMINATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
L 13	Var,coil,(LV1-221)	220μH		
L 14	Var,coil,(LV1-221)	220μH		
L 15	Var,coil,(LV1-101)	100μH		
L 16	Var,coil,(LV1-680)	68μH		
L 17	Var,coil,(LV1-220)	22μH		
L 18	Var,coil,(LV1-220)	22μH		
L 19	Var,coil,(LV1-6R8)	6.8μH		
L 20	Var,coil,(LV1-6R8)	6.8μH		
L 21	Microinductor,(LF8-221K)	220μH		
L 22	Microinductor,(LF8-221K)	220μH		
L 23	Microinductor,(LF8-221K)	220μH		
L 24	Var,coil,(LV2-152)	1500μH		
L 25	Coil,(339T20184C)	2.18mH		
L 26	Not assigned			
L 27	Coil,(10K17-55)			
L 28	Coil,(10K17-85)			
L 29	Microinductor,(LF8-101K	100μH		
L 30	Microinductor,(LF8-101K)	100μH		
L 31	Microinductor,(LF8-101K)	100μH		
L 32	Microinductor,(LF8-101K)	100μH		
L 33	Microinductor,(LF8-101K)	100μH		
L 34	Microinductor,(LF8-101K)	100μH		
L 35	Not assigned			
L 36	Not assigned			
L 37	Coil,(10K17-65T)			
Q 1	Tr,Si,NPN,(2SC1252)			
Q 2	Tr,Si,NPN,(2SC1252)			
Q 3	Tr,Si,NPN,(2SC1252)			
Q 4	Tr,Si,NPN,(2SC1834)			
Q 5	Tr,Si,NPN,(2SC1252)			
Q 6	IC,(UA733CN)			
Q 7	Tr,Si,NPN,(2SC1834)			
Q 8	Tr,Si,NPN,(2SC1834)			
Q 9	Tr,Si,NPN,(2SC1252)			
Q 10	Di,Si,(1S953)			

( ): Manufacturer's part number

* : Selected at factory

44W73717 5/12

Table 6-15 COMPONENT LIST OF DISCRIMINATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
Q 11	Di,Si,(1S953)			
Q 12	Di,Si,(1S953)			
Q 13	Di,Si,(1S953)			
Q 14	Di,Si,(1S953)			
Q 15	Di,Si,(1S953)			
Q 16	Di,Si,(1S953)			
Q 17	Di,Si,(1S953)			
Q 18	Di,Si,(1S953)			
Q 19	IC,(μPA67C)			
Q 20	IC,(μPA67C)			
Q 21	IC,(74LS27)			
Q 22	IC,(74LS00)			
Q 23	Tr,Si,NPN,(2SC1834)			
Q 24	Di,Si,(1SS97)			
Q 25	Di,Si,(1SS97)			
Q 26	Di,Si,(1S2222)			
Q 27	IC,(74LS10)			
Q 28	IC,(μPB602B)			
Q 29	Di,Si,(1S953)			
Q 30	Tr,Si,PNP,(2SA708)			
Q 31	Di,breakdown,(RD6.2EB)	5.8 to 6.6V,400mW		
Q 32	Di,Ge,(SD34)			
Q 33	Di,Si,(1S953)			
Q 34	IC,(74LS08)			
Q 35	IC,(74LS08)			
Q 36	Di,Si,(1S953)			
Q 37	Di,Si,(1S953)			
Q 38	Di,breakdown,(RD3.9EB)	3.7 to 4.1V,400mW		
Q 39	Tr,Si,NPN,(2SC1834)			
Q 40	Tr,Si,NPN,(2SC1834)			
Q 41	Tr,Si,NPN,(2SC1834)			
Q 42	IC,(74LS290)			
Q 43	IC,(HD74121)			
Q 44	Tr,Si,PNP,(2SA883)			
Q 45	Tr,Si,PNP,(2SA883)			
Q 46	Tr,Si,PNP,(2SA883)			
Q 47	IC,(μPC151C)			
Q 48	Di,breakdown,(1SZ52)	5.9 to 6.5V,250mW		
Q 49	Di,breakdown,(RD6.2EB)	5.8 to 6.6V,400mW		
Q 50	IC,(μPC177C)			
Q 51	IC,(74LS27)			
Q 52	Di,breakdown,(RD7.5EB)	7.0 to 7.9V,400mW		
Q 53	Di,Si,(1S953)			
Q 54	IC,(TC4053BP)			
Q 55	IC,(μPC55A)			

( ): Manufacturer's part number

* : Selected at factory

44W73717 6/12

Table 6-15 COMPONENT LIST OF DISCRIMINATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
Q 56	Di,breakdown,(1SZ52)	5.9 to 6.5V,250mW		
Q 57	Di,breakdown,(RD3.9EB)	3.7 to 4.1V,400mW		
Q 58	Di,breakdown,(RD3.9EB)	3.7 to 4.1V,400mW		
Q 59	Tr,Si,NPN,(2SC1833)			
Q 60	IC,(ICL8038CCJD)			
Q 61	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 62	IC,(μPC251C)			
Q 63	Tr,Si,NPN,(2SC1833)			
Q 64	Tr,Si,NPN,(2SC1833)			
Q 65	IC,(TC4053BP)			
Q 66	IC,(μPC251C)			
Q 67	IC,(TL082CP)			
Q 68	IC,(74121)			
Q 69	Tr,Si,NPN,(2SC1833)			
Q 70	Di,Si,(1S953)			
Q 71	Di,Si,(1S953)			
D 72	Di,Si,(1S953)			
Q 73	IC,(μPC251C)			
Q 74	Di,Si,(1S953)			
Q 75	Di,Si,(1S953)			
Q 76	IC,(μPC251C)			
Q 77	Di,Si,(1S2222)			
Q 78	Di,Si,(1S2222)			
Q 79	Di,Si,(1S2222)			
Q 80	IC,(TC4053BP)			
Q 81	Di,breakdown,(RD3.9EB)	3.7 to 4.1V,400mW		
Q 82	IC,(μPC151C)			
Q 83	Di,breakdown,(RD5.1EB)			
R 1	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 2	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 3	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 4	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 5	CF,(ARD25T4R7J)	4.7Ω,±5%,1/4W		
R 6	CF,(ARD25T101J)	[illegible]		
R 7	CF,(ARD25T101J)	[illegible]		
R 8	CF,(ARD25T221J)	[illegible]		
R 9	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 10	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 11	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 12	CF,(ARD25T560J)	56Ω,±5%,1/4W		
R 13	CF,(ARD25T560J)	56Ω,±5%,1/4W		
R 14	Var,MF,(RJ-1P 1kΩ)	1kΩ,1/2W		
R 15	CF,(ARD25T391J)	390Ω,±5%,1/4W		
R 16	CF,(ARD25T391J)	390Ω,±5%,1/4W		
R 17	CF,(ARD25T821J)	820Ω,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-15 COMPONENT LIST OF DISCRIMINATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
R 18	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 19	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 20	CF,(ARD25T220J)	22Ω,±5%,1/4W		
R 21	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 22	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 23	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 24	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 25	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 26	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 27	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 28	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 29	Not assigned			
R 30	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 31	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 32	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 33	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 34	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 35	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 36	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 37	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 38	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 39	CF,(ARD25T471J)	470Ω,±5%,1/4W		
* 40	Not assigned			
R 41	Var,MF,(RJ-6S 100Ω)	100Ω,1/2W		
R 42	Var,MF,(RJ-6S 100Ω)	100Ω,1/2W		
R 43	Var,MF,(RF-6S 100Ω)	100Ω,1/2W		
R 44	Var,MF,(RJ-6S 100Ω)	100Ω,1/2W		
R 45	Var,MF,(RJ-6S 100Ω)	100Ω,1/2W		
R 46	Var,MF,(RJ-6S 100Ω)	100Ω,1/2W		
R 47	Var,MF,(RJ-6S 100Ω)	100Ω,1/2W		
R 48	Var,MF,(RJ-6S 100Ω)	100Ω,1/2W		
R 49	Var,MF,(RJ-6S 100Ω)	100Ω,1/2W		
R 50	Not assigned			
R 51	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 52	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 53	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 54	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 55	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 56	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 57	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 58	Not assigned			
R 59	Not assigned			
R 60	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 61	Not assigned			
R 62	Not assigned			
R 63	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-15 COMPONENT LIST OF DISCRIMINATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
R 64	Not assigned			
R 65	Not assigned			
R 66	Not assigned			
R 67	CF,(ARD25T271J)	270Ω,±5%,1/4W		
R 68	CF,(ARD25T271J)	270Ω,±5%,1/4W		
R 69	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R 70	Not assigned			
R 71	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 72	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 73	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 74	CF,(ARD25T271J)	270Ω,±5%,1/4W		
R 75	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 76	CF,(ARD25T*J)	1k to 3.3kΩ,±5%,1/4W		Q'ty 0 or 1
R 77	CF,(ARD25T330J)	33Ω,±5%,1/4W		
R 78	CF,(ARD25T391J)	390Ω,±5%,1/4W		
R 79	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 80	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 81	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 82	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 83	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 84	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 85	CF,(ARD25T331J)	330Ω,±5%,1/4W		
* 86	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 87	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 88	Not assigned			
R 89	Not assigned			
R 90	CF,(RS1FB 68ΩJ)	68Ω,±5%,1W		
R 91	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 92	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 93	Var,MF,(RJ-6S 100Ω)	100Ω,1/2W		
R 94	Not assigned			
R 95	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 96	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 97	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 98	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 99	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 100	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 101	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 102	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 103	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 104	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 105	MF,(RN14K2E1001D)	1kΩ,±0.5%,1/4W		
R 106	MF,(RN14K2E2871D)	2.87kΩ,±0.5%,1/4W		
R 107	MF,(RN14K2E3401D)	3.4kΩ,±0.5%,1/4W		
R 108	MF,(RN14K2E1001D)	1kΩ,±0.5%,1/4W		
R 109	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 110	MF,(RN14K2E2491D)	2.49kΩ,±0.5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-15 COMPONENT LIST OF DISCRIMINATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
R 111	MF,(RN14K2E5111D)	5.11kΩ,±0.5%,1/4W		
R 112	Var,MF,(RJ-1S 1kΩ)	1kΩ,1/2W		
R 113	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 114	MF,(RN14K2E3401D)	3.4kΩ,±0.5%,1/4W		
R 115	MF,(RN14K2E3401D)	3.4kΩ,±0.5%,1/4W		
R 116	MF,(RN14K2E1501D)	1.5kΩ,±0.5%,1/4W		
R 117	Not assigned			
R 118	Not assigned			
R 119	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 120	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 121	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 122	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 123	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 124	CF,(ARD25T474J)	470kΩ,±5%,1/4W		
R 125	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 126	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 127	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R 128	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 129	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 130	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
* 131	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 132	CF,(ARD25T822J)	8.2kΩ,±5%,1/4W		
R 133	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 134	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
* 135	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 136	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 137	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 138	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 139	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 140	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 141	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 142	Var,MF,(RJ-6S 500kΩ)	500kΩ,1/2W		
R 143	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 144	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 145	Var,MF,(RJ-6S 2kΩ)	2kΩ,1/2W		
R 146	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 147	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 148	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 149	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 150	Not assigned			
R 151	V ar,MF,(RJ-6S 20kΩ)	20kΩ,1/2W		
R 152	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 153	CF,(ARD25T334J)	330kΩ,±5%,1/4W		
R 154	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 155	CF,(ARD25T151J)	150Ω,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-15 COMPONENT LIST OF DISCRIMINATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
R 156	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 157	CF,(ARD25T391J)	390Ω,±5%,1/4W		
R 158	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 159	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R 160	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R 161	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 162	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 163	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R 164	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 165	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 166	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 167	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 168	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 169	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R 170	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 171	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 172	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 173	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 174	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 175	CF,(ARD25T273J)	27kΩ,±5%,1/4W		
R 176	Var,MF,(RJ-6S 10kΩ)	10kΩ,1/2W		
R 177	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 178	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 179	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 180	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 181	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 182	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 183	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 184	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 185	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R 186	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 187	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 188	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 189	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 190	CF,(ARD24T224J)	220kΩ,±5%,1/4W		
R 191	Var,MF,(RJ-6S 100kΩ)	100kΩ,1/2W		
R 192	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 193	CF,(ARD25T684J)	680kΩ,±5%,1/4W		
R 194	CF,(ARD25T154J)	150kΩ,±5%,1/-W		
R 195	Var,MF,(RJ-6S 50kΩ)	50kΩ,1/2W		
R 196	Var,MF,(RJ-6S 100kΩ)	100kΩ,1/2W		
R 197	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 198	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 199	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 200	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-15 COMPONENT LIST OF DISCRIMINATOR (Z4)

CKT REF	DESCRIPTION	RATING		NOTE
R 201	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 202	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 203	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 204	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 205	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 206	Not assigned			
R 207	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 208	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 209	CF,(ARD25T220J)	22Ω,±5%,1/4W		
R 210	Not assigned			
R 211	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 212	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 213	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 214	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 215	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 216	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 217	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 218	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 219	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 220	CF,(ARD25T474J)	470kΩ,±5%,1/4W		
R 221	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 222	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 223	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 224	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 225	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 226	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 227	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 228	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 229	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R 230	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 231	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 232	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 233	CF,(ARD25T100J)	10Ω,±5%,1/4W		
R 234	CF,(ARD25T*J)	10Ω to 47Ω,±5%,1/4W		Q'ty 0 or 1
R 235	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 236	CF,(ARD25T394J)	390kΩ,±5%,1/4W		
R 237	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(RPD670C472M50V)	4700pF,±20%,50V		
C 2	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 3	Not assigned			
C 4	Not assigned			
C 5	Not assigned			
C 6	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 7	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 8	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 9	Cer,(CK924C1H222M)	2200pF,±20%,50V		
C 10	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 11	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 12	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 13	Cer,(RPN710C223M50V)	0.22μF,±20%,50V		
C 14	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 15	Cer,(RPN710C223M50V)	0.22μF,±20%,50V		
C 16	Cer,(RPN710C223M50V)	0.22μF,±20%,50V		
C 17	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 18	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 19	Elect,(CE04W1V4R7)	4.7μF,+20%,35V		
C 20	Cer,(RD340CK010CY50)	1pF,±0.25pF,50V		Q'ty 0 or 1
C 21	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 22	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 23	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 24	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 25	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 26	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 27	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 28	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 29	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 30	Cer,(CC924K1H020C)	2pF,±0.25pF,50V		
C 31	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 32	Not assigned			
C 33	Not assigned			
C 34	Not assigned			
C 35	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 36	Elect,(CE04W1V220)	22μF,±20%,35V		
C 37	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 38	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 39	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 40	Not assigned			
C 41	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 42	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 43	Elect,(CE04W1V220)	22μF,±20%,35V		
C 44	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 45	Cer,(CK924C1H472M)	4700pF,±20%,50V		

( ): Manufacturer's part number
* : Selected at factory

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
C 46	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 47	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 48	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 49	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 50	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 51	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 52	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 53	Cer,(CC924CH1H220J)	22pF,±5%,50V		
C 54	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 55	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 56	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 57	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 58	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 59	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 60	Not assigned			
C 61	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 62	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 63	Not assigned			
C 64	Not assigned			
C 65	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 66	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 67	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 68	Cer,(CC924CH1H430J)	43pF,±5%,50V		
C 69	Cer,(CC924CH1H100D)	10pF,±0.5pF,50V		
C 70	Not assigned			
C 71	Not assigned			
C 72	Cer,(CC924CH1H680J)	68pF,±5%,50V		
C 73	Cer,(CC924CH1H100D)	10pF,±0.5pF,50V		
C 74	Cer,(CC924CH1H330J)	33pF,±5%,50V		
C 75	Cer,(CC934CH1H020C)	2pF,±0.25pF,50V		
C 76	Cer,(CC924CK1H680J)	68pF,±5%,50V		
C 77	Cer,(CC924CK1H020C)	2pF,±0.25pF,50V		
C 78	Cer,(CC924CH1H330J)	33pF,±5%,50V		
C 79	Not assigned			
C 80	Not assigned			
C 81	Cer,(CC924CH1H270J)	27pF,±5%,50V		
C 82	Not assigned			
C 83	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 84	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 85	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 86	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 87	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 88	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 89	Plast,(ECQ-P1 152FZ)	1500pF,±1%,100V		
C 90	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
C 91	Cer,(CC924CH1H100D)	10pF,±0.5pF,50V		
C 92	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 93	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 94	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 95	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 96	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 97	Not assigned			
C 98	Not assigned			
C 99	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 100	Not assigned			
C 101	Cer,(CK924C1H222M)	2200pF,±20%,50V		
C 102	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 103	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 104	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 105	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 106	Elect,(CE04W1V100)	10μF,±20%,35V		
C 107	Elect,(CE04W1V100)	10μF,±20%,35V		
C 108	Elect,(CE04W1V220)	22μF,±20%,35V		
C 109	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 110	Cer,(RPE111CH271G50)	270pF,±2%,50V		
C 111	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 112	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 113	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 114	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 115	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 116	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 117	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 118	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 119	Elect,(CE04W1J2R2)	2.2μF,±20%,63V		
C 120	Not assigned			
C 121	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 122	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 123	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 124	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 125	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 126	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 127	Cer,(RPE111CH301G50)	300pF,±2%,50V		
C 128	Cer,(RPE111CH181G50)	180pF,±2%,50V		
C 129	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 130	Not assigned			
C 131	Cer,(CC924CH1H100D)	10pF,±0.5pF,50V		
C 132	Cer,(CC924CH1H331J)	330pF,±5%,50V		
C 133	Elect,(CE04W1V100)	10μF,±20%,35V		
C 134	Elect,(CE04W1V100)	10μF,±20%,35V		
C 135	Cer,(CC924CH1H101J)	100pF,±5%,50V		

( ): Manufacturer's part number
* : Selected at factory

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
C 136	Elect,(CE04W1V100)	10μF,±20%,35V		
C 137	Elect,(CE04W1V100)	10μF,±20%,35V		
C 138	Plast,(ECQ-P1562FZ)	5600pF,±1%,50V		
C 139	Cer,(CC924CH1H680J)	68pF,±5%,50V		
C 140	Not assigned			
C 141	Plast,(ECQ-P1 162FZ)	1600pF,±1%,100V		
C 142	Not assigned			
C 143	Plast,(ECQ-P1 162FZ)	1600pF,±1%,100V		
C 144	Elect,(CE04W1A470)	47μF,±20%,10V		
C 145	Elect,(CE04W1A470)	47μF,±20%,10V		
C 146	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 147	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 148	Plast,(ECQ-P1 182FZ)	160pF,±2%,50V		
C 149	Cer,(RPE111CH561G50)	560pF,±2%,50V		
C 150	Cer,(RPE111CH391G50)	390pF,±2%,50V		
C 151	Cer,(RD340CK010CY50)	1pF,±0.25pF,50V		
C 152	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 153	Cer,(CC924CK1H020C)	2pF,±0.25pF,50V		
C 154	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 155	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 156	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 157	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 158	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 159	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 160	Not assigned			
C 161	Cer,(RPE111CH361G50)	360pF,±2%,50V		
C 162	Cer,(CC924CH1H330J)	33pF,±5%,50V		
C 163	Cer,(RPE111CH361G50)	360pF,±2%,50V		
C 164	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 165	Not assigned			
C 166	Cer,(CK924C1H222M)	2200pF,±20%,50V		
C 167	Cer,(CK924C1H222M)	2200pF,±20%,50V		
C 168	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 169	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 170	Not assigned			
C 171	Cer,(CK924C1H473M)	0.047μF,±20%,50V		
C 172	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 173	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 174	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 175	Not assigned			
C 176	Not assigned			
C 177	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 178	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 179	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 180	Cer,(CK924C1H104M)	0.1μF,±20%,50V		

( ): Manufacturer's part number
* : Selected at factory

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
C 181	Cer,(CK924C1H222M)	2200pF,±20%,50V		
C 182	Cer,(CK924C1H222M)	2200pF,±20%,50V		
C 183	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 184	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 185	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 186	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 187	Not assigned			
C 188	Not assigned			
C 189	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 190	Not assigned			
C 191	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 192	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 193	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 194	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 195	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 196	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 197	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 198	Elect,(CE04W1V100)	10μF,±20%,35V		
C 199	Elect,(CE04W1V100)	10μF,±20%,35V		
C 200	Not assigned			
C 201	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 202	Cer,(CC924CH1H680J)	68pF,±5%,50V		
C 203	Elect,(CE04W1V100)	10μF,±20%,35V		
C 204	Elect,(CE04W1V100)	10μF,±20%,35V		
C 205	Cer,(RPE111CH*G50)	330p to 680pF,±2%,50V		*
C 206	Plast,(ECQ-P1*FZ)	3000p to 5600pF,±1%,100V		*
C 207	Tant,(CS02H1C3R3M)	3.3μF,±20%,16V		
C 208	Not assigned			
C 209	Elect,(CE04W1V220)	22μF,±20%,35V		
C 210	Not assigned			
C 211	Elect,(CE04W1V220)	22μF,±20%,35V		
C 212	Elect,(CE04W1V220)	22μF,±20%,35V		
C 213	Elect,(CE04W1V220)	22μF,±20%,35V		
C 214	Elect,(CE04W1V220)	22μF,±20%,35V		
C 215	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 216	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 217	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 218	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 219	Not assigned			
C 220	Not assigned			
C 221	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 222	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 223	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 224	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 225	Cer,(CC924CH1H220J)	22pF,±5%,50V		
C 226	Cer,(RPE111CH*G50)	120p to 220pF,±2%,50V		*

( ): Manufacturer's part number
* : Selected at factory

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
J 1	Produced by pattern			
J 2	Receptacle,(BNC-R601)			
J 3	Receptacle,(BNC-R601)			
J 4	Connector,(PI021-02M)			
K 1	Relay,(SF-102)			
K 2	Relay,(SF-102)			
K 3	Relay,(SF-102)			
L 1	Coil,(44T46070C)			
L 2	Coil,(44T46070B)			
L 3	Coil,(44T46070B)			
L 4	Coil,(SP0408-R22K)			
L 5	Coil,(44T46070A)			
L 6	Microinductor,(LF8-221K)	220μH		
L 7	Microinductor,(LF8-221K)	220μH		
L 8	Microinductor,(LF8-221K)	220μH		
L 9	Coil,(339T10268A)			
L 10	Not assigned			
L 11	Coil,(10K17-85)			
L 12	Coil,(339T10267A)			
L 13	Microinductor,(LF8-221K)	220μH		
L 14	Not assigned			
L 15	Not assigned			
L 16	Coil,(10K-17-25T)			
L 17	Coil,(339T10627A)			
L 18	Microinductor,(LF8-221K)	220μH		
L 19	Microinductor,(LF8-221K)	220μH		
L 20	Not assigned			
L 21	Coil,(10K-17-25T)			
L 22	Microinductor,(LF8-221K)	220μH		
L 23	Microinductor,(LF8-221K)	220μH		
L 24	Microinductor,(LF8-221K)	220μH		
L 25	Coil,(339T20195G)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING	NOTE
L 26	Coil,(FS0810S-332K)	3.3mH	
L 27	Coil,(339T20195H)		
L 28	Not assigned		
L 29	Not assigned		
L 30	Not assigned		
L 31	Microinductor,(LF8-221K)	220μH	
L 32	Coil,(339T10267A)		
L 33	Var,coil,(LV1-2R2)	2.2μH	
L 34	Coil,(339T10267A)		
L 35	Microinductor,(LF8-221K)	220μH	
L 36	Microinductor,(LF8-221K)	220μH	
L 37	Microinductor,(LF8-221K)	220μH	
L 38	Not assigned		
L 39	Not assigned		
L 40	Not assigned		
L 41	Microinductor,(LF8-221K)	220μH	
L 42	Var,coil,(LV2-102)	1mH	
L 43	Var,coil,(LV2-102)	1mH	
L 44	Microinductor,(LF8-100K)	10μH	
L 45	Microinductor,(LF8-100K)	10μH	
L 46	Microinductor,(LF8-100K)	10μH	
L 47	Microinductor,(LF8-100K)	10μH	
L 48	Microinductor,(LV1-681)	680μH	
Q 1	Di,Si,(1S2222)		
Q 2	Di,Si,(1S2222)		
Q 3	Di,Si,(1S2222)		
Q 4	Di,Si,(1S2222)		
Q 5	Tr,Si,NPN,(2SC2368)		
Q 6	Tr,Si,NPN,(2SC2368)		
Q 7	Di,Si,(1SS99)		
Q 8	Di,Si,(1S953)		
Q 9	Di,Si,(1S953)		
Q 10	Not assigned		
Q 11	Di,Si,(1S953)		
Q 12	Tr,Si,NPN,(2SC1254)		
Q 13	Di,varicap,(FC53M)		

( ): Manufacturer's part number
* : Selected at factory

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING	NOTE
Q 14	Tr,Si,NPN,(2SC1254)		
Q 15	Tr,Si,NPN,(2SC1254)		
Q 16	Tr,Si,NPN,(2SC1254)		
Q 17	Tr,Si,NPN,(2SC1254)		
Q 18	Tr,Si,NPN,(2SC1252)		
Q 19	Tr,Si,NPN,(2SC1252)		
Q 20	Not assigned		
Q 21	Tr,Si,NPN,(2SC2368)		
Q 22	Tr,Si,NPN,(2SC1252)		
Q 23	Tr,Si,NPN,(2SC1252)		
Q 24	Not assigned		
Q 25	Not assigned		
Q 26	Tr,Si,NPN,(2SC2116)		
Q 27	IC,(UA733CN)		
Q 28	Tr,Si,NPN,(2SC1834)		
Q 29	Tr,Si,NPN,(2SC1834)		
Q 30	Not assigned		
Q 31	Tr,Si,NPN,(2SC1834)		
Q 32	Tr,Si,NPN,(2SC1834)		
Q 33	Not assigned		
Q 34	Not assigned		
Q 35	Tr,Si,NPN,(2SC1834)		
Q 36	Tr,Si,NPN,(2SC1834)		
Q 37	Di,Si,(1SS97)		
Q 38	IC,(μPC251C)		
Q 39	Di,Si,(1SS97)		
Q 40	Not assigned		
Q 41	Di,Si,(1SS97)		
Q 42	Di,Si,(1S2222)		
Q 43	Di,Si,(1S2222)		
Q 44	Tr,Si,NPN,(2SC1834)		
Q 45	Di,Si,(1SS97)		
Q 46	Di,Si,(1SS97)		
Q 47	Di,Si,(1SS97)		
Q 48	Di,Si,(1SS97)		
Q 49	IC,(UA733CN)		
Q 50	Di,Si,(1S953)		
Q 51	Tr,Si,NPN,(2SC1834)		
Q 52	Di,Si,(1S953)		
Q 53	Di,Si,(1S953)		
Q 54	IC,(μPC251C)		
Q 55	Tr,Si,PNP,(2SA883)		
Q 56	Di,Si,(1SS97)		
Q 57	Di,Si,(1SS97)		
Q 58	IC,(μPC251C)		
Q 59	IC,(μPC251C)		
Q 60	Not assigned		

( ): Manufacturer's part number
* : Selected at factory

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING	NOTE
Q 61	IC,(μPA39A)		
Q 62	Di,breakdown,(RD7.5EB)	7.0 to 7.9V,400mW	
Q 63	Di,breakdown,(RD7.5EB)	7.0 to 7.9V,400mW	
Q 64	IC,(μPC251C)		
Q 65	Not assigned		
Q 66	Not assigned		
Q 67	Not assigned		
Q 68	Tr,Si,NPN,(2SC2116)		
Q 69	Tr,Si,NPN,(2SC2116)		
Q 70	Not assigned		
Q 71	IC,(UA733CN)		
Q 72	Di,Si,(1S2222)		
Q 73	Tr,Si,NPN,(2SC1834)		
Q 74	Tr,Si,NPN,(2SC1834)		
Q 75	Tr,Si,NPN,(2SC1834)		
Q 76	IC,(UA733CN)		
Q 77	Di,Si,(1S2222)		
Q 78	Tr,Si,NPN,(2SC1834)		
Q 79	Tr,Si,NPN,(2SC1834)		
Q 80	Not assigned		
Q 81	Tr,Si,PNP,(2SA711)		
Q 82	Tr,Si,NPN,(2SC1834)		
Q 83	Not assigned		
Q 84	Not assigned		
Q 85	Tr,Si,NPN,(2SC1834)		
Q 86	Di,Si,(1SS97)		
Q 87	Di,Si,(1SS97)		
Q 88	IC,(μPC251C)		
Q 89	IC,(μPC251C)		
Q 90	Not assigned		
Q 91	IC,(μPA39A)		
Q 92	IC,(TC4053BP)		
Q 93	IC,(μPC251C)		
Q 94	Di,Si,(1S953)		
Q 95	Di,Si,(1S953)		
Q 96	Di,Si,(1S953)		
Q 97	IC,(μPC251C)		
Q 98	Di,Si,(1S953)		
Q 99	Di,Si,(1S953)		
Q 100	Not assigned		
Q 101	Di,Si,(1S953)		
Q 102	Di,Si,(1S953)		

( ): Manufacturer's part number
* : Selected at factory

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING	NOTE
R 1	MF,(NRN1/4C4 439ΩD)	439Ω,±0.5%,1/4W	
R 2	MF,(NRN1/4C4 439ΩD)	439Ω,±0.5%,1/4W	
R 3	MF,(NRN1/4C4 26.7ΩD)	26.7Ω,±0.5%,1/4W	
R 4	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 5	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 6	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W	
R 7	MF,(NRN1/4C4 332ΩD)	332Ω,±0.5%,1/4W	
R 8	MF,(NRN1/4C4 332ΩD)	332Ω,±0.5%,1/4W	
R 9	MF,(NRN1/4C4 35.7ΩD)	35.7Ω,±0.5%,1/4W	
R 10	Not assigned		
R 11	MF,(NRN1/4C4 174ΩD)	174Ω,±0.5%,1/4W	
R 12	MF,(NRN1/4C4 174ΩD)	174Ω,±0.5%,1/4W	
R 13	MF,(NRN1/4C4 79.3ΩD)	79.3Ω,±0.5%,1/4W	
R 14	MF,(NRN1/4C4 103.3ΩD)	103.3Ω,±0.5%,1/4W	
R 15	MF,(NRN1/4C4 103.3ΩD)	103.3Ω,±0.5%,1/4W	
R 16	MF,(NRN1/4C4 231ΩD)	231Ω,±0.5%,1/4W	
R 17	MF,(NRN1/4C4 332ΩD)	332Ω,±0.5%,1/4W	
R 18	MF,(NRN1/4C4 56.2ΩD)	56.2Ω,±0.5%,1/4W	
R 19	MF,(NRN1/4C4 174ΩD)	174Ω,±0.5%,1/4W	
R 20	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 21	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W	
R 22	MF,(NRN1/4C4 436ΩD)	436Ω,±0.5%,1/4W	
R 23	CF,(ARD25T101J)	100Ω,±5%,1/4W	
R 24	MF,(NRN1/4C4 50ΩD)	50Ω,±0.5%,1/4W	
R 25	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 26	MF,(NRN1/4C4 26.7ΩD)	26.7Ω,±0.5%,1/4W	
R 27	CF,(ARD25T681J)	680Ω,±5%,1/4W	
R 28	MF,(NRN1/4C4 332ΩD)	332Ω,±0.5%,1/4W	
R 29	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W	
R 30	Not assigned		
R 31	CF,(ARD25T104J)	100kΩ,±5%,1/4W	
R 32	CF,(ARD25T103J)	10kΩ,±5%,1/4W	
R 33	CF,(ARD25T100J)	10Ω,±5%,1/4W	
R 34	CF,(ARD25T100J)	10Ω,±5%,1/4W	
R 35	CF,(ARD25T100J)	10Ω,±5%,1/4W	
R 36	CF,(ARD25T680J)	68Ω,±5%,1/4W	
R 37	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 38	CF,(ARD25T221J)	220Ω,±5%,1/4W	
R 39	CF,(ARD25T221J)	220Ω,±5%,1/4W	
R 40	Not assigned		
R 41	CF,(ARD25T680J)	68Ω,±5%,1/4W	
R 42	CF,(ARD25T102J)	1kΩ,±5%,1/4W	
R 43	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W	
R 44	CF,(ARD25T151J)	150Ω,±5%,1/4W	
R 45	CF,(ARD25T681J)	680Ω,±5%,1/4W	

( ): Manufacturer's part number
* : Selected at factory

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
R 46	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 47	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 48	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 49	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 50	Not assigned			
R 51	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 52	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 53	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 54	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 55	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 56	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 57	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 58	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 59	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 60	Not assigned			
R 61	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 62	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 63	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 64	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 65	MF,(NRN1/4C4 436ΩD)	436Ω,±0.5%,1/4W		
R 66	MF,(NRN1/4C4 436ΩD)	436Ω,±0.5%,1/4W		
R 67	MF,(NRN1/4C4 11.5ΩD)	11.5Ω,±0.5%,1/4W		
R 68	MF,(NRN1/4C4 11.5ΩD)	11.5Ω,±0.5%,1/4W		
R 69	CF,(ARD25T181J)	180Ω,±5%,1/4W		
R 70	Not assigned			
R 71	CF,(ARD25T330J)	33Ω,±5%,1/4W		
R 72	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 73	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 74	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 75	CF,(ARD25T271J)	270Ω,±5%,1/4W		
R 76	CF,(ARD25T271J)	270Ω,±5%,1/4W		
R 77	CF,(ARD25T150J)	15Ω,±5%,1/4W		
R 78	CF,(ARD25T150J)	15Ω,±5%,1/4W		
R 79	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 80	Not assigned			
R 81	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 82	CF,(ARD25T330J)	33Ω,±5%,1/4W		
R 83	MF,(NRN1/4C4 439ΩD)	439Ω,±0.5%,1/4W		
R 84	MF,(NRN1/4C4 439ΩD)	439Ω,±0.5%,1/4W		
R 85	Not assigned			
R 86	Not assigned			
R 87	Not assigned			
R 88	MF,(NRN1/4C4 75ΩD)	75Ω,±0.5%,1/4W		
R 89	MF,(NRN1/4C4 56.2ΩD)	56.2Ω,±0.5%,1/4W		
R 90	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

44W73718 11/17

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
R 91	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 92	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 93	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 94	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 95	MF,(NRN1/4C4 11.5ΩD)	11.5Ω,±0.5%,1/4W		
R 96	MF,(NRN1/4C4 75.0ΩD)	75Ω,±0.5%,1/4W		
R 97	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 98	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 99	Not assigned			
R 100	Not assigned			
R 101	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 102	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 103	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 104	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 105	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 106	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 107	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 108	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 109	Not assigned			
R 110	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 111	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 112	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 113	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 114	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 115	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 116	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 117	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 118	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 119	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 120	Not assigned			
R 121	Not assigned			
R 122	Not assigned			
R 123	Not assigned			
R 124	Not assigned			
R 125	Not assigned			
R 126	Not assigned			
R 127	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 128	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 129	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 130	Not assigned			
R 131	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 132	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 133	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 134	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 135	CF,(ARD25T104J)	100kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory'

44W73718 12/17

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
R 136	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 137	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 138	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 139	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 140	Not assigned			
R 141	CF,(ARD25T181J)	180Ω,±5%,1/4W		
R 142	Thermister,(OS-D5-300-1)			
R 143	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R 144	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 145	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R 146	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 147	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 148	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 149	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 150	Not assigned			
R 151	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R 152	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 153	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 154	CF,(ARD25T271J)	270Ω,±5%,1/4W		
R 155	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 156	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 157	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 158	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 159	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 160	Not assigned			
R 161	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 162	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 163	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 164	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 165	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 166	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 167	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 168	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 169	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 170	Not assigned			
R 171	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 172	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 173	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R 174	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 175	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 176	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 177	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 178	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 179	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R 180	CF,(ARD25T104J)	100kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

44W73718 13/17

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
R 181	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 182	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 183	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 184	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 185	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 186	Var,MF,(RJ-6P 500kΩ)	500kΩ,1/2W		
R 187	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 188	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 189	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 190	Not assigned			
R 191	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 192	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 193	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R 194	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R 195	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 196	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 197	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 198	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W		
R 199	Var,MF,(RJ-6P 500kΩ)	500kΩ,1/2W		
R 200	MF,(RN14K2E2211D)	2.21kΩ,±0.5%,1/4W		
R 201	MF,(RN14K2E9311D)	9.31kΩ,±0.5%,1/4W		
R 202	Var,WW,(442R42845)	60Ω		
R 203	CF,(ARD25T6R8J)	6.8Ω,±5%,1/4W		
R 204	MF,(RN14K2E2001D)	2kΩ,±0.5%,1/4W		
R 205	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 206	Var,MF,(RJ-6P 500Ω)	500Ω,1/2W		
R 207	Not assigned			
R 208	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 209	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 210	Not assigned			
R 211	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 212	Thermister,(OS-D5-300-1)			
R 213	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 214	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 215	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 216	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 217	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 218	MF,(NRTF1/4C 68ΩJ)	68Ω,±5%,1/4W		
R 219	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 220	Not assigned			
R 221	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 222	MF,(NRN1/4C4 75ΩD)	75Ω,±0.5%,1/4W		
R 223	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 224	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 225	MF,(NRN1/4C4 26.7ΩD)	26.7Ω,±0.5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

44W73718 14/17

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
R 226	MF,(NRN1/4C4 26.7ΩD)	26.7Ω,±0.5%,1/4W		
R 227	MF,(NRN1/4C4 439ΩD)	439Ω,±0.5%,1/4W		
R 228	MF,(NRN1/4C4 439ΩD)	439Ω,±0.5%,1/4W		
R 229	MF,(NRN1/4C4 75ΩD)	75Ω,±0.5%,1/4W		
R 230	Not assigned			
R 231	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 232	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 233	MF,(NRN1/4C4 35.7ΩD)	35.7Ω,±0.5%,1/4W		
R 234	MF,(NRN1/4C4 11.5ΩD)	11.5Ω,±0.5%,1/4W		
R 235	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 236	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 237	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 238	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 239	CF,(ARD25T202J)	2kΩ,±5%,1/4W		
R 240	Not assigned			
R 241	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 242	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 243	Var,MF,(RJ-6P 100Ω)	100Ω,1/2W		
R 244	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 245	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 246	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 247	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 248	Var,MF,(RJ-6P 100Ω)	100Ω,1/2W		
R 249	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 250	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 251	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 252	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 253	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 254	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 255	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R 256	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 257	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 258	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 259	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 260	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 261	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 262	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 263	Var,MF,(RJ-6P 500Ω)	500Ω,1/2W		
R 264	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 265	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 266	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 267	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 268	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R 269	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 270	CF,(ARD25T221J)	220Ω,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
R 271	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 272	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 273	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 274	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 275	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R 276	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 277	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 278	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 279	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 280	Not assigned			
R 281	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 282	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 283	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 284	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 285	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 286	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 287	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 288	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 289	Var,MF,(RJ-6P 500kΩ)	500kΩ,1/2W		
R 290	Not assigned			
R 291	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W		
R 292	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 293	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 294	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R 295	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 296	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 297	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 298	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W		
R 299	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R 300	Not assigned			
R 301	MF,(RN14K2E2211D)	2.21kΩ,±0.5%,1/4W		
R 302	Var,MF,(RJ-6P 500kΩ)	500kΩ,1/2W		
R 303	MF,(RN14K2E9311D)	9.31kΩ,±0.5%,1/4W		
R 304	Var,WW,(442R42845)	60Ω		
R 305	CF,(ARD25T6R8J)	6.8Ω,±5%,1/4W		
R 306	MF,(RN14K2E2001D)	2kΩ,±0.5%,1/4W		
R 307	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 308	Not assigned			
R 309	Not assigned			
R 310	Not assigned			
R 311	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 312	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 313	CF,(ARD25T100J)	10Ω,±5%,1/4W		
R 314	Var,MF,(RJ-6P 500kΩ)	500kΩ,1/2W		
R 315	Var,MF,(RJ-6P 500kΩ)	500kΩ,1/2W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-16 COMPONENT LIST OF IF MIX AND RETURN LOSS (Z5)

CKT REF	DESCRIPTION	RATING		NOTE
R 316	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 317	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 318	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 319	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 320	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 321	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 322	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 323	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 324	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 325	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 326	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 327	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 328	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 329	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 330	Not assigned			
R 331	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 332	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 333	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 334	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R 335	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 336	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 337	MF,(RN14K2E25R5D)	25.5Ω,±0.5%,1/4W		
R 338	MF,(RN14K2E4320D)	432Ω,±0.5%,1/4W		
R 339	MF,(RN14K2E4320D)	432Ω,±0.5%,1/4W		
R 340	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R 341	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 342	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 343	CF,(ARD25T334J)	330kΩ,±5%,1/4W		
R 344	CF,(ARD25T684J)	680kΩ,±5%,1/4W		
R 345	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 346	CF,(ARD25T684J)	680kΩ,±5%,1/4W		
T 1	Trans,(342T55677B)			
T 2	Trans,(342T55677B)			
Z 1	R&KM7D.B.M			
Z 2	R&KM7D.B.M			

( ): Manufacturer's part number
* : Selected at factory

Table 6-17 COMPONENT LIST OF MARKER AND SPECTRUM (Z6)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CC924CH1H150J)	15pF,±5%,50V		
C 2	Cer,(CC924CH1H120J)	12pF,±5%,50V		
C 3	Cer,(CC924CH1H150J)	15pF,±5%,50V		
C 4	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 5	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 6	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 7	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 8	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 9	Cer,(CC924CH1H100D)	10pF,±0.5pF,50V		ME538A/B/C
C 10	Not assigned			
C 11	Cer,(CC924CH1H100D)	10pF,±0.5pF,50V		ME538A/B/C
C 12	Cer,(CC924CH1H150J)	15pF,±5%,50V		ME538A/B/C
C 13	Cer,(CC924CH1H101J)	100pF,±5%,50V		ME538A/B/C
C 14	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		ME538A/B/C
C 15	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		ME538A/B/C
C 16	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 17	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 18	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 19	Cer,(CK942C1H102M)	1000pF,±20%,50V		
C 20	Not assigned			
C 21	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 22	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 23	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 24	Cer,(CC924CH1H680J)	68pF,±5%,50V		
C 25	Cer,(CC924CH1H680J)	68pF,±5%,50V		
C 26	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 27	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 28	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 29	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 30	Cer,(CC924CH1H470J)	47pF,±5%,50V		
C 31	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 32	Elect,(CE04W1V100)	10μF,±20%,35V		
C 33	Elect,(CE04W1E470)	47μF,±20%,35V		
C 34	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 35	Cer,(CK924C1H103M)	0.01μF,±20%,50V		
C 36	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 37	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 38	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 39	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 40	Not assigned			
C 41	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 42	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 43	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 44	Cer,(CC924CH1H680J)	68pF,±5%,50V		
C 45	Cer,(CC924CH1H680J)	68pF,±5%,50V		

( ): Manufacturer's part number
* : Selected at factory

Table 6-17 COMPONENT LIST OF MARKER AND SPECTRUM (Z6)

CKT REF	DESCRIPTION	RATING		NOTE
C 46	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 47	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 48	Elect,(CE04W1E470)	47uF,±20%,25V		
C 49	Elect,(CE04W1A470)	47uF,±20%,10V		
C 50	Not assigned			
C 51	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 52	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 53	Elect,(CE04W1A470)	47uF,±20%,10V		
C 54	Cer,(CC924CH1H100D)	10pF,±0.5pF,50V		
C 55	Cer,(CC924CJ1H030C)	3pF,±0.25pF,50V		
C 56	Cer,(CC924CJ1H030C)	3pF,±0.25pF,50V		
C 57	Cer,(CC924CH1H220J)	22pF,±5%,50V		
C 58	Plast,(ECQ-M1H 103KZ)	0.01uF,±10%,50V		
C 59	Elect,(CE04W1A470)	47uF,±20%,10V		
C 60	Not assigned			
C 61	Plast,(ECQ-M1H 104KZ)	0.1uF,±10%,50V		
C 62	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 63	Plast,(ECQ-M1H 223KZ)	0.022uF,±10%,50V		
C 64	Elect,(CE04W1J2R2)	2.2uF,±20%,63V		
C 65	Plast,(ECQ-M1H 104KZ)	0.1uF,±10%,50V		
C 66	Elect,(CE04W1J2R2)	2.2uF,±20%,63V		
C 67	Elect,(CE04W1J2R2)	2.2uF,±20%,63V		
C 68	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 69	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 70	Not assigned			
C 71	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 72	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 73	Not assigned			
C 74	Cer,(CK924CH1H104M)	0.1uF,±20%,50V		
C 75	Plast,(ECQ-M1H 104KZ)	0.1uF,±10%,50V		
C 76	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 77	Plast,(ECQ-M1H 223KZ)	0.022uF,±10%,50V		
C 78	Elect,(CE04W1J2R2)	2.2uF,±20%,63V		
C 79	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 80	Cer,(CC924CH1H470J)	47pF,±5%,50V		
C 81	Elect,(CE04W1J2R2)	2.2uF,±20%,63V		
C 82	Elect,(CE04W1J2R2)	2.2uF,±20%,63V		
C 83	Plast,(ECQ-M1H 104KZ)	0.1uF,±10%,50V		
C 84	Elect,(CE04W1J2R2)	2.2uF,±20%,63V		
C 85	Elect,(CE04W1J2R2)	2.2uF,±20%,63V		
C 86	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 87	Plast,(ECQ-M1H 223KZ)	0.022uF,±10%,50V		
C 88	Plast,(ECQ-M1H 103KZ)	0.01uF,±10%,50V		
C 89	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 90	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

Table 6-17 COMPONENT LIST OF MARKER AND SPECTRUM (Z6)

CKT REF	DESCRIPTION	RATING		NOTE
C 91	Plast,(ECQ-M1H 223KZ)	0.022uF,±10%,50V		
C 92	Plast,(ECQ-M1H 104KZ)	0.1uF,±10%,50V		
C 93	Elect,(CE04W1A470)	47uF,±20%,10V		
C 94	Plast,(ECQ-M1H 103KZ)	0.01uF,±10%,50V		
C 95	Elect,(CE04W1A470)	47uF,±20%,10V		
C 96	Plast,(ECQ-M1H 103KZ)	0.01uF,±10%,50V		
C 97	Elect,(CE04W1A470)	47uF,±20%,10V		
C 98	Elect,(CE04W1J1R0)	1uF,±20%,63V		
C 99	Not assigned			
C 100	Not assigned			
C 101	Plast,(ECQ-M1H 103KZ)	0.01uF,±10%,50V		
C 102	Plast,(ECQ-M1H 103KZ)	0.01uF,±10%,50V		
C 103	Cer,(CC924CH1H200J)	20pF,±5%,50V		
C 104	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 105	Plast,(ECQ-M1H 103KZ)	0.01uF,±10%,50V		
C 106	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 107	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 108	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 109	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 110	Not assigned			
C 111	Elect,(CE04W1V100)	10uF,±20%,35V		
C 112	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 113	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 114	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 115	Cer,(CC924CJ1H030C)	3pF,±0.25pF,50V		
C 116	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 117	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 118	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 119	Cer,(CC924CH1H050D)	5pF,±0.5pF,50V		
C 120	Cer,(CC924CH1H050D)	5pF,±0.5pF,50V		
C 121	Plast,(ECQ-M1H 473KZ)	0.047uF,±10%,50V		
C 122	Cer,(CK924C1H104M)	0.1uF,±20%,50V		
C 123	Cer,(CK924C1H104M)	0.1uF,±20%,50V		
C 124	Elect,(CE04W1V220)	22uF,±20%,35V		
C 125	Elect,(CE04W1V220)	22uF,±20%,35V		
C 126	Elect,(CE04W1A470)	47uF,±20%,10V		
C 127	Elect,(CE04W1A470)	47uF,±20%,10V		
C 128	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 129	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 130	Not assigned			
C 131	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 132	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 133	Cer,(CK924C1H104M)	0.1uF,±20%,50V		
C 134	Cer,(CK924C1H104M)	0.1uF,±20%,50V		
C 135	Cer,(CK924C1H104M)	0.1uF,±20%,50V		

( ): Manufacturer's part number
* : Selected at factory

Table 6-17 COMPONENT LIST OF MARKER AND SPECTRUM (Z6)

CKT REF	DESCRIPTION	RATING		NOTE
C 136	Cer,(CK924C1H104M)	0.1uF,±20%,50V		
C 137	Cer,(CK924C1H070M)	7pF,±20%,50V		
J 1	Produced by pattern			
J 2	Connector,(PI011-02M)			
J 3	Connector,(PI011-02M)			
J 4	Connector,(PI011-02M)			
K 1	Relay,(NR-S-12V)			
L 1	Coil,(442L71369E)			
L 2	Coil,(34L55686D 10K17-5.5T)			
L 3	Microinductor,(LF8-221K)	220uH		
L 4	Coil,(442L71369F)			
L 5	Coil,(34L55686B 10K17-3.5T)			
L 6	Microinductor,(LF8-100K)	10uH		
L 7	Coil,(SP0408-R33K)			
L 8	Coil,(SP0408-R33K)			
L 9	Coil,(SP0408-R33K)			
L 10	Not assigned			
L 11	Coil,(44T46070A)			
L 12	Microinductor,(LF8-101K)	100uH		
L 13	Microinductor,(LF8-101K)	100uH		
L 14	Microinductor,(LF8-220K)	22uH		
L 15	Microinductor,(LF8-101K)	100uH		
L 16	Microinductor,(LF8-101K)	100uH		
L 17	Microinductor,(LF8-101K)	100uH		
L 18	Microinductor,(LF8-101K)	100uH		

( ): Manufacturer's part number
* : Selected at factory

Table 6-17 COMPONENT LIST OF MARKER AND SPECTRUM (Z6)

CKT REF	DESCRIPTION	RATING		NOTE
L 19	Microinductor,(LF8-101K)	100uH		
L 20	Not assigned			
L 21	Microinductor,(LF8-101K)	100uH		
L 22	Microinductor,(LF8-101K)	100uH		
L 23	Microinductor,(LF8-101K)	100uH		
L 24	Microinductor,(LF8-101K)	100uH		
L 25	Microinductor,(LF8-101K)	100uH		
L 26	Microinductor,(LF8-101K)	100uH		
L 27	Microinductor,(LF8-101K)	100uH		
L 28	Microinductor,(LF8-221K)	220uH		
L 29	Microinductor,(LF8-221K)	220uH		
L 30	Not assigned			
L 31	Coil,(LH1-472K)	4.7mH		
L 32	Coil,(LH1-103K)	10mH		
L 33	Coil,(LH1-103K)	10mH		
L 34	Microinductor,(LF8-470K)	47uH		
L 35	Microinductor,(LF8-470K)	47uH		
L 36	Microinductor,(LF8-470K)	47uH		
L 37	Microinductor,(LF8-470K)	47uH		
L 38	Coil,(SP0408-R47K)	0.47uH		
L 39	Microinductor,(LF8-101K)	100uH		
Q 1	Tr,Si,NPN,(2SC1254)			
Q 2	Tr,Si,NPN,(2SC1254)			
Q 3	Tr,Si,NPN,(2SC1254)			
Q 4	Tr,Si,NPN,(2SC1254)			
Q 5	Tr,Si,NPN,(2SC1833)			
Q 6	Di,Si,(1S953)			
Q 7	Tr,Si,NPN,(2SC1834)			
Q 8	Tr,Si,NPN,(2SC1252)			
Q 9	Tr,Si,NPN,(2SC1252)			
Q 10	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

Table 6-17 COMPONENT LIST OF MARKER AND SPECTRUM (Z6)

CKT REF	DESCRIPTION	RATING		NOTE
Q 11	Tr,Si,PNP,(2SA883)			
Q 12	Tr,Si,NPN,(2SC1833)			
Q 13	Tr,Si,NPN,(2SC1254)			
Q 14	Tr,Si,NPN,(2SC1254)			
Q 15	Di,varicap,(FC53M)			
Q 16	Tr,Si,NPN,(2SC1252)			
Q 17	IC,(74LS00)			
Q 18	IC,(74LS390)			
Q 19	IC,(74LS390)			
Q 20	Not assigned			
Q 21	IC,(74LS293)			
Q 22	Di,Si,(1S953)			
Q 23	Tr,Si,PNP,(2SA711)			
Q 24	Di,Si,(1S953)			
Q 25	Tr,Si,NPN,(2SC2368)			
Q 26	Tr,Si,NPN,(2SC2368)			
Q 27	Tr,Si,PNP,(2SA883)			
Q 28	Tr,Si,NPN,(2SC1833)			
Q 29	IC,(UA733CN)			
Q 30	Not assigned			
Q 31	Di,Si,(1S953)			
Q 32	IC,(μPC177C)			
Q 33	Tr,Si,NPN,(2SC1833)			
Q 34	IC,(UA733CN)			
Q 35	Di,Si,(1S2222)			
Q 36	IC,(UA733CN)			
Q 37	Di,Si,(1S953)			
Q 38	Tr,Si,NPN,(2SC1833)			
Q 39	IC,(UA733CN)			
Q 40	Not assigned			
Q 41	IC,(74S00)			
Q 42	IC,(74S74)			
Q 43	IC,(74LS290)			
Q 44	IC,(μPC251C)			
Q 45	Di,Si,(1S953)			
Q 46	IC,(74LS00)			
Q 47	Tr,Si,NPN,(2SC1833)			
Q 48	Tr,Si,NPN,(2SC1833)			
Q 49	IC,(TC4066BP)			
Q 50	Not assigned			
Q 51	Di,breakdown,(RD9.1EB)	8.5 to 9.6V,400mW		
Q 52	IC,(μPC251C)			
Q 53	Tr,Si,NPN,(2SC1833)			
Q 54	Tr,Si,NPN,(2SC1834)			
Q 55	Tr,Si,NPN,(2SC1834)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-17 COMPONENT LIST OF MARKER AND SPECTRUM (Z6)

CKT REF	DESCRIPTION	RATING		NOTE
Q 56	Tr,Si,NPN,(2SC1834)			
Q 57	IC,(74LS00)			
Q 58	Tr,Si,PNP,(2SA883)			
Q 59	Tr,Si,NPN,(2SC1834)			
Q 60	Not assigned			
Q 61	IC,(μPC157C)			
Q 62	IC,(μPC151C)			
R 1	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 2	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 3	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 4	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 5	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 6	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 7	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 8	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 9	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 10	Not assigned			
R 11	CF,(ARD25T122J)	1.2kΩ,±5%,1/4W		
R 12	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 13	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 14	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 15	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 16	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 17	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 18	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 19	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 20	Not assigned			
R 21	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 22	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 23	CF,(ARD25T820J)	82Ω,±5%,1/4W		
R 24	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 25	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 26	CF,(ARD25T271J)	270Ω,±5%,1/4W		
R 27	CF,(ARD25T271J)	270Ω,±5%,1/4W		
R 28	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 29	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 30	Not assigned			
R 31	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 32	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 33	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 34	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 35	CF,(ARD25T103J)	10kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-17 COMPONENT LIST OF MARKER AND SPECTRUM (Z6)

CKT REF	DESCRIPTION	RATING		NOTE
R 36	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 37	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 38	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 39	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 40	Not assigned			
R 41	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 42	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 43	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 44	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 45	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 46	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 47	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 48	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 49	CF,(ARD25T271J)	270Ω,±5%,1/4W		
R 50	Not assigned			
R 51	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 52	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 53	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 54	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 55	Not assigned			
R 56	Not assigned			
R 57	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 58	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 59	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 60	Not assigned			
R 61	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 62	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 63	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 64	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 65	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 66	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 67	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 68	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 69	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 70	Not assigned			
R 71	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 72	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 73	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 74	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 75	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 76	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 77	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 78	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 79	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 80	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

Table 6-17 COMPONENT LIST OF MARKER AND SPECTRUM (Z6)

CKT REF	DESCRIPTION	RATING		NOTE
R 81	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 82	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R 83	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 84	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 85	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 86	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 87	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 88	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 89	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 90	Not assigned			
R 91	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 92	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 93	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 94	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 95	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 96	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 97	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 98	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 99	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 100	Not assigned			
R 101	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 102	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 103	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 104	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 105	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 106	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 107	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 108	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 109	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R 110	Not assigned			
C 111	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 112	CF,(ARD25T222J)	2.2kΩ,±5%,1/2W		
R 113	CF,(ARD25T680J)	68Ω,±5%,1/4W		
R 114	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 115	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 116	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 117	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 118	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 119	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 120	Not assigned			
R 121	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 122	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 123	CF,(ARD25T750J)	75Ω,±5%,1/4W		
R 124	CF,(ARD25T470J)	47Ω,±5%,1/4W		
R 125	CF,(ARD25T102J)	1kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-17 COMPONENT LIST OF MARKER AND SPECTRUM (Z6)

CKT REF	DESCRIPTION	RATING		NOTE
R 126	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 127	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 128	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 129	CF,(ARD25T822J)	8.2kΩ,±5%,1/4W		
R 130	Not assigned			
R 131	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 132	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 133	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 134	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 135	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 136	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 137	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 138	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 139	Var,MF,(RJ-6S 100kΩ)	100kΩ,1/2W		
R 140	Not assigned			
R 141	Var,MF,(RJ-6S 100kΩ)	100kΩ,1/2W		
R 142	Var,MF,(RJ-6S 100kΩ)	100kΩ,1/2W		
R 143	Var,MF,(RJ-6S 10kΩ)	10kΩ,1/2W		
R 144	CF,(ARD25T391J)	390Ω,±5%,1/4W		
R 145	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 146	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 147	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 148	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 149	Not assigned			
R 150	Not assigned			
R 151	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 152	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 153	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 154	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 155	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 156	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 157	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 158	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 159	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 160	Not assigned			
R 161	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 162	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 163	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 164	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 165	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 166	CF,(ARD25T561J)	560Ω,±5%,1/4W		
R 167	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 168	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 169	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 170	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

Table 6-17 COMPONENT LIST OF MARKER AND SPECTRUM (Z6)

CKT REF	DESCRIPTION	RATING		NOTE
R 171	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 172	Var,MF,(RJ-6S 1kΩ)	1kΩ,1/2W		
R 173	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 174	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 175	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 176	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 177	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 178	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 179	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 180	CF,(ARD25T151J)	150Ω,±5%,1/4W		
T 1	Trans,(342T55677B)			
X 1	XTAL,OSC,(44X71111C)	87.78MHz		
X 2	XTAL,OSC,(44X71111D)	122.220MHz		ME538A/B/C
X 3	XTAL,OSC,(44X64091B)	17.78MHz		
Z 1	Mixer,(R&KM7D.B.M)	8 pins		
Z 2	Mixer,(R&KM7D.B.M)	8 pins		
Z 3	Mixer,(R&KM1D.B.M)	8 pins		

( ): Manufacturer's part number
* : Selected at factory

Table 6-18 COMPONENT LIST OF CPU (Z7)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CC924CH1H150J)	15pF,±5%,50V		
C 2	Cer,(CC924CH1H220J)	22pF,±5%,50V		
C 3	Elect,(CE04W1V100)	10μF,±20%,35V		
C 4	M Plast,(FNX-HS1003-105K)	1μF,±10%,100V		
C 5	Cer,(CK924C1H102M)	1000pF,±20%,50V		
C 6	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 7	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 8	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 9	Cer,(CC924C1H104M)	0.1μF,±20%,50V		
C 10	Not assigned			
C 11	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 12	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 13	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 14	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 15	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 16	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 17	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 18	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 19	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 20	Not assigned			
C 21	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 22	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 23	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 24	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 25	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 26	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 27	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 28	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 29	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 30	Not assigned			
C 31	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 32	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 33	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 34	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 35	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 36	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 37	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 38	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 39	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 40	Not assigned			
C 41	Elect,(CE04W1A470)	47μF,±20%,10V		
C 42	Elect,(CE04W1A470)	47μF,±20%,10V		
C 43	Elect,(CE04W1A470)	47μF,±20%,10V		
C 44	Tant,(CS02H0J331M)	330μF,±20%,6.3V		
C 45	Elect,(CE04W1V220)	22μF,±20%,35V		

( ): Manufacturer's part number
* : Selected at factory

Table 6-18 COMPONENT LIST OF CPU (Z7)

CKT REF	DESCRIPTION	RATING		NOTE
C 46	Elect,(CE04W1V220)	22μF,±20%,35V		
C 47	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 48	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 49	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 50	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 51	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 52	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
J 1	Plug,(produced by pattern)			
J 2	Connector,(HIF3-34P-2.54DS)			
J 3	Connector,(HIF3-26P-2.54DS)			
J 4	Connector,(HIF3-34P-2.54DS)			Option
J 5	Connector,(PI021-2M)			
Q 1	IC,(μPD8085AC)			
Q 2	IC,(HN462716G)			
Q 3	IC,(HN462716G)			
Q 4	IC,(HN462716G)			
Q 5	IC,(μPD2101ALC-4)			
Q 6	IC,(μPD2101ALC-4)			
Q 7	IC,(74LS373)			
Q 8	IC,(74LS367)			
Q 9	IC,(74LS367)			
Q 10	Not assigned			
Q 11	IC,(74LS138)			
Q 12	IC,(74154)			
Q 13	IC,(74LS138)			
Q 14	IC,(74154)			
Q 15	IC,(μPD8279C-5)			
Q 16	IC,(TC4508BP)			
Q 17	IC,(μPD8253C-5)			
Q 18	IC,(ICL7109CPL)			
Q 19	IC,(TC4051BP)			
Q 20	Not assigned			
Q 21	Not assigned			
Q 22	IC,(74LS174)			
Q 23	IC,(74LS373)			
Q 24	IC,(TC4508BP)			
Q 25	IC,(TC4508BP)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-18 COMPONENT LIST OF CPU (Z7)

CKT REF	DESCRIPTION	RATING		NOTE
Q 26	IC,(TC4508BP)			
Q 27	IC,(TC4508BP)			
Q 28	Not assigned			
Q 29	IC,(7406)			
Q 30	Not assigned			
Q 31	IC,(74LS125A)			
Q 32	IC,(74LS367)			
Q 33	IC,(74LS367)			
Q 34	IC,(74LS174)			
Q 35	IC,(74LS367)			
Q 36	IC,(74LS244)			
Q 37	Not assigned			
Q 38	IC,(74LS04)			
Q 39	IC,(74LS04)			
Q 40	IC,(74LS04)			
Q 41	Not assigned			
Q 42	IC,(74LS32)			
Q 43	IC,(74LS32)			
Q 44	IC,(HN462732G)			GP-IB OPTION
Q 45	Di,Si,(1S953)			
Q 46	Not assigned			
Q 47	Not assigned			
Q 48	Not assigned			
Q 49	Not assigned			
Q 50	Not assigned			
Q 51	Tr,Si,PNP,(2SA539 Ⓢ)			
Q 52	Di,breakdown,(RD3.9EB)	3.7 to 4.1V,400mW		
Q 53	Di,Si,(1S953)			
Q 54	Di,Si,(1S953)			
Q 55	Di,breakdown,(RD7.5EB)	7.0 to 7.9V,400mW		
Q 56	Di,breakdown,(RD7.5EB)	7.0 to 7.9V,400mW		
Q 57	Di,Si,(1S953)			
R 1	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R 2	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 3	Not assigned			
R 4	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 5	MF,(RN14K2E1003D)	100kΩ,±0.5%,1/4W		
R 6	MF,(RN14K2E1003D)	100kΩ,±0.5%,1/4W		
R 7	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 8	MF,(RN14K2E4991D)	4.99kΩ,±0.5%,1/4W		
R 9	Var,MF,(RJ-6S 20kΩ)	20kΩ,1/2W		
R 10	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

Table 6-18 COMPONENT LIST OF CPU (Z7)

CKT REF	DESCRIPTION	RATING		NOTE
R 11	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 12	Single in-line ally, (IHR-8-332JA)	3.3kΩ×8		
R 13	Single in-line ally, (IHR-8-332JA)	3.3kΩ×8		
R 14	Single in-line ally, (IHR-8-223JA)	22kΩ×8		
R 15	Not assigned			
R 16	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R 17	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 18	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 19	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 20	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 21	Not assigned			
R 22	Not assigned			
R 23	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 24	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 25	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 26	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 27	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
X 1	XTAL OSC,NC-18C	4MHz		

( ): Manufacturer's part number
* : Selected at factory

Table 6-19 COMPONENT LIST OF MOTHER BOARD (Z9)

CKT REF	DESCRIPTION	RATING		NOTE
J 1	Connector,(225J-2221-587)			
J 2	Connector,(225J-2221-587)			
J 3	Connector,(225J-2221-587)			
J 4	Connector,(225J-2221-587)			
J 5	Connector,(225J-2221-587)			
J 6	Connector,(225J-2221-587)			
J 7	Connector,(225J-2221-587)			
J 8	Connector,(225J-2221-587)			
J 9	Connector,(U-PB2219)			
J 10	Connector,(U-PB2219)			
J 11	Connector,(U-PA1019)			
J 12	Connector,(U-PA1019)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-20 COMPONENT LIST OF OPERATING LED BOARD (Z10)

CKT REF	DESCRIPTION	RATING		NOTE
J 1	Connector,(HIF23A-60D-AA30S)	60P		
J 2	Connector,(HIF23A-30D AA30S)	30P		
Q 1 to Q 18	LED,(LN513GK)			
Q 19	Not assigned			
Q 20	Not assigned			
Q 21	Not assigned			
Q 22	Not assigned			
Q 23	LED,(LN38GP)			
Q 24	Not assigned			
Q 25	LED,(LN38GP)			
Q 26	Not assigned			
Q 27 to Q 39	LED,(LN38GP)			
Q 40	Not assigned			
Q 41	LED,(LN38GP)			
Q 42	Not assigned			
Q 43	LED,(LN38GP)			
Q 44	Not assigned			
Q 45 to Q 66	LED,(LN38GP)			
Q 67	Not assigned			
Q 68	Not assigned			
Q 69	Not assigned			
Q 70	LED,(LN38GP)			
Q 71	LED,(LN38GP)			
Q 72	LED,(LN38GP)			
Q 73	LED,(LN38GP)			
Q 74	LED,(LN38GP)			
Q 75	LED,(LN38GP)			
Q 76	Not assigned			
Q 77	Not assigned			
Q 78	Not assigned			
Q 79	LED,(LN38GP)			
Q 80	LED,(LN38GP)			
Q 81	LED,(LN38GP)			
Q 82	LED,(LN38GP)			
Q 83	LED,(LN38GP)			
Q 84	LED,(LN38GP)			
Q 85	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

Table 6-20 COMPONENT LIST OF OPERATING LED BOARD (Z10)

CKT REF	DESCRIPTION	RATING		NOTE
Q 86	Not assigned			
Q 87	Not assigned			
Q 88	Not assigned			
Q 89	Not assigned			
Q 90	Not assigned			
Q 91 to Q 102	LED, (TLG226)			
Q 103	Not assigned			
Q 104	LED, (342GPH)			
Q 105	LED, (342GPH)			
R 1	Var, MF, (RG161N20SB 10kΩ×M)	10kΩ, 1/2W		
R 2	Not assigned			
R 3	Not assigned			
R 4	PMTR, WW, (20HP-5S 50kΩ)	50kΩ		
R 5	Var, MF, (RG161N20SB 10kΩM)	10kΩ, 1/2W		
R 6	Var, MF, (RG161N20SB 10kΩM)	10kΩ, 1/2W		
R 7	CF, (ARD25T221J)	220Ω, ±5%, 1/4W		
R 8	CF, (ARD25T330J)	33Ω, ±5%, 1/4W		
R 9	CF, (ARD25T330J)	33Ω, ±5%, 1/4W		
R 10	CF, (ARD25T330J)	33Ω, ±5%, 1/4W		
R 11	CF, (ARD25T330J)	33Ω, ±5%, 1/4W		
R 12	CF, (ARD25T330J)	33Ω, ±5%, 1/4W		
R 13	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 14	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 15	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 16	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 17	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 18	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 19	CF, (ARD25T330J)	33Ω, ±5%, 1/4W		
R 20	CF, (ARD25T101J)	100Ω, ±5%, 1/4W		
S 2 to S 22	Switch, (KEC11902)			
S 23	Not assigned			
S 24	Slide, (SL7-4(PH)8H6-2-2)			ME538A/B/C
S 25	Slide, (ESD32109)			
S 26	Switch, (KEC11902)			

( ): Manufacturer's part number
* : Selected at factory

44W73722 2/2

Table 6-21 COMPONENT LIST OF LED DRIVER (Z11)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Elect, (CE04W1A471)	470μF, ±20%, 10V		
C 2	Cer, (CK924C1H104M)	0.1μF, ±20%, 50V		
C 3	Cer, (CK924C1H104M)	0.1μF, ±20%, 50V		
C 4	Cer, (CK924C1H104M)	0.1μF, ±20%, 50V		
C 5	Cer, (CK924C1H104M)	0.1μF, ±20%, 50V		
C 6	Cer, (CK924C1H104M)	0.1μF, ±20%, 50V		
C 7	Plast, (ECQ-M1H 472KZ)	4700pF, ±10%, 50V		
C 8	Plast, (ECQ-M1H 472KZ)	4700pF, ±10%, 50V		
C 9	Plast, (ECQ-M1H 102KZ)	1000pF, ±10%, 50V		
C 10	Plast, (ECQ-M1H 102KZ)	1000pF, ±10%, 50V		
C 11	Plast, (ECQ-M1H 472KZ)	4700pF, ±10%, 50V		
C 12	Plast, (ECQ-M1H 472KZ)	4700pF, ±10%, 50V		
C 13	Plast, (ECQ-M1H 472KZ)	4700pF, ±10%, 50V		
C 14	Plast, (ECQ-M1H 472KZ)	4700pF, ±10%, 50V		
C 15	Plast, (ECQ-M1H 472KZ)	4700pF, ±10%, 50V		
C 16	Plast, (ECQ-M1H 472KZ)	4700pF, ±10%, 50V		
C 17	Elect, (CE04W1A470)	47μF, ±20%, 10V		
C 18	Cer, (CC924CH1H470J)	47pF, ±5%, 50V		
C 20	Cer, (CC924CH1H470J)	47pF, ±5%, 50V		
C 21	Cer, (CC924CH1H470J)	47pF, ±5%, 50V		
C 22	Cer, (CC924CH1H470J)	47pF, ±5%, 50V		
C 23	Cer, (CC924CH1H470J)	47pF, ±5%, 50V		
C 24	Cer, (CC924CH1H470J)	47pF, ±5%, 50V		
J 1	Connector, (HIF3-60P-2.54DSA)	60 pins		
J 2	Connector, (HIF3-30P-2.54DSA)	30 pins		
J 3	Connector, (HIF3-26P-2.54DSA)	26 pins		
J 4	Connector, (U-PB2221)	22 pins		
J 5	Connector, (PI011-2M)	2 pins		
Q 1	IC, (74LS156)			
Q 2	IC, (74LS138)			
Q 3	IC, (74LS174)			
Q 4	IC, (74LS174)			
Q 5	IC, (74LS174)			
Q 6	IC, (74LS174)			
Q 7	IC, (74LS75)			
Q 8	IC, (TC4514BP)			
Q 9	IC, (TD62004P)			
Q 10	IC, (TD62004P)			
Q 11	IC, (TD62004P)			
Q 12	IC, (TD62004P)			
Q 13	IC, (μPA56C)			
Q 14	Not assigned			
Q 15	IC, (74LS247)			

( ): Manufacturer's part number
* : Selected at factory

44W73723 1/4

Table 6-21 COMPONENT LIST OF LED DRIVER (Z11)

CKT REF	DESCRIPTION	RATING		NOTE
Q 16	IC, (μPA56C)			
Q 17	IC, (7407)			
Q 18	IC, (7407)			
Q 19	IC, (7407)			
Q 20	IC, (7407)			
Q 21	IC, (74LS04)			
Q 22	IC, (7406)			
Q 23	IC, (7406)			
Q 24	IC, (7407)			
Q 25	IC, (74LS74A)			
Q 26	IC, (74LS04)			
Q 27	IC, (74LS00)			
Q 28	IC, (TC5032P)			
Q 29	IC, (74LS248)			
Q 30	IC, (μPA56C)			
Q 31	IC, (74LS04)			
Q 32	IC, (TD62003P)			
Q 33	IC, (TC4050P)			
R 1	CF, (ARD25T221J)	220Ω, ±5%, 1/4W		
R 2	CF, (ARD25T221J)	220Ω, ±5%, 1/4W		
R 3	CF, (ARD25T221J)	220Ω, ±5%, 1/4W		
R 4	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 5	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 6	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 7	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 8	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 9	CF, (ARD25T221J)	220Ω, ±5%, 1/4W		
R 10	CF, (ARD25T221J)	220Ω, ±5%, 1/4W		
R 11	CF, (ARD25T221J)	220Ω, ±5%, 1/4W		
R 12	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 13	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 14	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 15	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 16	CF, (ARD25T150J)	15Ω, ±5%, 1/4W		
R 17	CF, (ARD25T150J)	15Ω, ±5%, 1/4W		
R 18	CF, (ARD25T150J)	15Ω, ±5%, 1/4W		
R 19	CF, (ARD25T150J)	15Ω, ±5%, 1/4W		
R 20	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 21	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 22	Single in-line ally, (IHR-4-104JA)	100kΩ×4		
R 23	Not assigned			
R 24	Not assigned			
R 25	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

44W73723 2/4

Table 6-21 COMPONENT LIST OF LED DRIVER (Z11)

CKT REF	DESCRIPTION	RATING		NOTE
R 26 to R 53	CF, (ARD25T4R7J)	4.7Ω, ±5%, 1/4W		
R 54	Single in-line ally, (IHR-8-222JA)	2.2kΩ×8		
R 55	Not assigned			
R 56	Not assigned			
R 57	Not assigned			
R 58	Not assigned			
R 59	Not assigned			
R 60	Not assigned			
R 61	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 62	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 63	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 64	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 65	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 66	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 67	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 68	Single in-line ally, (IHR-8-222JA)	2.2kΩ×8		
R 69	Not assigned			
R 70	Not assigned			
R 71	Not assigned			
R 72	Not assigned			
R 73	Not assigned			
R 74	Not assigned			
R 75	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 76	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 77	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 78	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 79	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 80	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 81	CF, (ARD25T820J)	82Ω, ±5%, 1/4W		
R 82	CF, (ARD25T222J)	2.2kΩ, ±5%, 1/4W		
R 83	CF, (ARD25T332J)	3.3kΩ, ±5%, 1/4W		
R 84	CF, (ARD25T472J)	4.7kΩ, ±5%, 1/4W		
R 85	CF, (ARD25T472J)	4.7kΩ, ±5%, 1/4W		
R 86	CF, (ARD25T105J)	1MΩ, ±5%, 1/4W		
R 87	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 88	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 89	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 90	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 91	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 92	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 93	CF, (ARD25T680J)	68Ω, ±5%, 1/4W		
R 94	Not assigned			
R 95	CF, (ARD25T472J)	4.7kΩ, ±5%, 1/4W		

( ): Manufacturer's part number
* : Selected at factory

44W73723 3/4

Table 6-21 COMPONENT LIST OF LED DRIVER (Z11)

CKT REF	DESCRIPTION	RATING		NOTE
R 96	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 97	Not assigned			
R 98	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 99	Not assigned			
R 100	Single in-line ally, (IHR-6-104JA)	100kΩ×6		
R 101	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 102	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 103	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 104	Not assigned			
R 105	Not assigned			
R 106	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

44W73723 | 4/4

Table 6-22 COMPONENT LIST OF X SELECT, X-Y RECORDER (Z12)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 2	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 3	Elect,(CE04W1E470)	47μF,±20%,25V		
C 4	Elect,(CE04W1E470)	47μF,±20%,25V		
C 5	Elect,(CE04W1E470)	47μF,±20%,25V		
C 6	Elect,(CE04W1E470)	47μF,±20%,25V		
C 7	Not assigned			
C 8	Not assigned			
C 9	Plast,(ECQ-M1H 223KZ)	0.022μF,±10%,50V		
C 10	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 11	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 12	Plast,(ECQ-P1 332FZ)	3300pF,±1%,100V		
C 13	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 14	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 15	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 16	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 17	Cer,(RPE113C474K50)	0.47μF,±10%,50V		
C 18	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 19	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 20	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 21	Elect,(CE04W1A101)	100μF,±20%,10V		
C 22	Elect,(CE04W1A101)	100μF,±20%,10V		
C 23	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 24	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 25	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 26	Plast,(ECQ-M1H 224KZ)	0.22μF,±10%,50V		
C 27	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 28	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 29	Not assigned			
C 30	Not assigned			
C 31	Elect,(CE04W1V220)	22μF,±20%,35V		
C 32	Elect,(CE04W1V220)	22μF,±20%,35V		
C 33	Elect,(CE04W1V220)	22μF,±20%,35V		
C 34	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 35	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 36	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 37	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 38	Plast,(ECQ-M1H 472KZ)	4700pF,±10%,50V		
C 39	Elect,(CE04W1V100)	10μF,±20%,35V		
C 40	Elect,(CE04W1A470)	47μF,±20%,35V		
C 41	Elect,(CE04W1A470)	47μF,±20%,10V		
C 42	Elect,(CE04W1A470)	47μF,±20%,10V		
C 43	Elect,(CE04W1A470)	47μF,±20%,10V		
C 44	Elect,(CE04W1A470)	47μF,±20%,10V		
C 45	Elect,(CE04W1A470)	47μF,±20%,10V		

( ): Manufacturer's part number
* : Selected at factory

44W73724 | 1/6

Table 6-22 COMPONENT LIST OF X SELECT, X-Y RECORDER (Z12)

CKT REF	DESCRIPTION	RATING		NOTE
C 46	Elect,(CE04W1V100)	10μF,±20%,35V		
C 47	Elect,(CE04W1V100)	10μF,±20%,35V		
C 48	Elect,(CE04W1V100)	10μF,±20%,35V		
C 49	Elect,(CE04W1V100)	10μF,±20%,35V		
C 50	Elect,(CE04W1V100)	10μF,±20%,35V		
C 51	Elect,(CE04W1V100)	10μF,±20%,35V		
C 52	Plast,(ECQ-P1204FZ)	0.2μF,±1%,50V		
C 53	Elect,(CE04W1J1R0)	1μF,±20%,63V		
C 54	Elect,(CE04W1J1R0)	1μF,±20%,63V		
J 1	Connector,(U-PB2221)	22 pins		
J 2	Connector,(U-PA0521)	5 pins		
J 3	Connector,(U-PB1521)	15 pins		
K 1	Relay,(NF2E-5V)			
Q 1	IC,(μPC251C)			
Q 2	Tr,Si,NPN,(2SC1833)			
Q 3	Tr,Si,NPN,(2SC1833)			
Q 4	IC,(74LS00)			
Q 5	IC,(74LS73)			
Q 6	IC,(74LS04)			
Q 7	IC,(74LS00)			
Q 8	IC,(74LS08)			
Q 9	Not assigned			
Q 10	IC,(μPC251C)			
Q 11	IC,(74LS10)			
Q 12	IC,(74LS00)			
Q 13	IC,(74LS00)			
Q 14	IC,(74LS27)			
Q 15	IC,(TC4066BP)			
Q 16	IC,(TC4066BP)			
Q 17	IC,(TC4066BP)			
Q 18	IC,(TC4066BP)			
Q 19	IC,(TC4066BP)			
Q 20	Not assigned			
Q 21	IC,(74LS27)			
Q 22	IC,(μPC251C)			
Q 23	Not assigned			
Q 24	IC,(TC4066BP)			
Q 25	IC,(μPC251C)			

( ): Manufacturer's part number
* : Selected at factory

44W73724 | 2/6

Table 6-22 COMPONENT LIST OF X SELECT, X-Y RECORDER (Z12)

CKT REF	DESCRIPTION	RATING		NOTE
Q 26	IC,(TC4066BP)			X-Y Recorder Option
Q 27	IC,(TL082CP)			
Q 28	IC,(μPC251C)			
Q 29	IC,(μPC251C)			
Q 30	Not assigned			
Q 31	Di,Si,(1S953)			
Q 32	Di,Si,(1S953)			
Q 33	Di,Si,(1S953)			
Q 34	Di,Si,(1S953)			
Q 35	Di,breakdown,(RD6.2EB)	5.8 to 6.6V,400mW		
Q 36	Di,Si,(1S953)			
Q 37	IC,(μPC251C)			
Q 38	IC,(74LS00)			
Q 39	IC,(74LS00)			
Q 40	IC,(74LS00)			
Q 41	IC,(TC40H000P)			
Q 42	Di,Si,(1S953)			
Q 43	Tr,Si,NPN,(2SC1833)			
Q 44	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 45	Tr,Si,NPN,(2SC1833)			
Q 46	LED,(LN38GP)			
Q 47	Di,Si,(1S953)			
Q 48	Di,Si,(1S953)			
Q 49	Di,Si,(1S953)			
Q 50	Tr,Si,NPN,(2SC1833)			
Q 51	Di,Si,PNP,(2SA883)			
Q 52	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 53	Di,Si,(1S953)			
Q 54	Di,Si,(1S953)			
Q 55	Tr,Si,NPN,(2SC1833)			
Q 56	Di,Si,(1S953)			
Q 57	IC,(μPC251C)			
R 1	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 2	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 3	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 4	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 5	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 6	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 7	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 8	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 9	CF,(ARD25T683J)	68kΩ,±5%,1/4W		
R 10	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 11	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 12	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 13	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 14	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 15	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

44W73724 | 3/6

Table 6-22 COMPONENT LIST OF X SELECT, X-Y RECORDER (Z12)

CKT REF	DESCRIPTION	RATING		NOTE
R 16	CF,(ARD25T121J)	120Ω,±5%,1/4W		
R 17	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 18	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 19	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 20	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 21	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 22	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 23	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 24	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 25	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 26	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 27	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 28	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 29	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 30	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 31	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 32	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 33	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 34	CF,(ARD25T223J)	22kΩ,±5%,1/4W		
R 35	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 36	CF,(ARD25T221J)	220Ω,±5%,1/4W		
R 37	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 38	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 39	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 40	Not assigned			
R 41	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 42	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 43	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 44	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 45	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R 46	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 47	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 48	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 49	Not assigned			
R 50	Not assigned			
R 51	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 52	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 53	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 54	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 55	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 56	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 57	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 58	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 59	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 60	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

Table 6-22 COMPONENT LIST OF X SELECT, X-Y RECORDER (Z12)

CKT REF	DESCRIPTION	RATING		NOTE
R 61	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 62	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 63	CF,(ARD25T823J)	82kΩ,±5%,1/4W		
R 64	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 65	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 66	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 67	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 68	CF,(ARD25T823J)	82kΩ,±5%,1/4W		
R 69	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 70	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 71	CF,(ARD25T562J)	5.6kΩ,±5%,1/4W		
R 72	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 73	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R 74	Not assigned			
R 75	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 76	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 77	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 78	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 79	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 80	Not assigned			
R 81	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 82	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 83	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 84	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 85	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 86	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 87	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 88	Var,MF,(RJ-6P 20kΩ)	20kΩ,1/2W		
R 89	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 90	Not assigned			
R 91	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 92	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 93	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 94	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 95	Not assigned			
R 96	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 97	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 98	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 99	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 100	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 101	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 102	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 103	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 104	Not assigned			
R 105	CF,(ARD25T474J)	470kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-22 COMPONENT LIST OF X SELECT, X-Y RECORDER (Z12)

CKT REF	DESCRIPTION	RATING		NOTE
R 106	CF,(ARD25T824J)	820kΩ,±5%,1/4W		
R 107	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 108	CF,(ARD25T153J)	1.5kΩ,±5%,1/4W		
R 109	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 110	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 111	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 112	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 113	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 114	Not assigned			
R 115	Var,MF,(RG161P20SB 100kΩM)	100kΩ,1/2W		
R 116	Var,MF,(RG161P20SB 100kΩM)	100kΩ,1/2W		
R 117	PMTR,WW,(44R58742A)	20kΩ,1/2W		
R 118	Not assigned			
R 119	Not assigned			
R 120	Not assigned			
R 121	Not assigned			
R 122	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 123	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 124	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 125	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 126	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W		
R 127	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W		
R 128	CF,(ARD25T564J)	560kΩ,±5%,1/4W		
R 129	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 130	Not assigned			
R 131	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 132	CF,(ARD25T682J)	6.8kΩ,±5%,1/4W		
R 133	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 134	Not assigned			
R 135	Not assigned			
R 136	Not assigned			
R 137	Not assigned			
R 138	Not assigned			
R 139	Not assigned			
R 140	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 141	CF,(ARD25T333J)	33kΩ,±5%,1/4W		
R 142	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 143	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 144	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
S 1	Pushbutton,(3F10 2U Gr37)			
S 2	Pushbutton,(1F 2U EE37)			
S 3	Pushbutton,(1F 2U EE37)			
S 4	Pushbutton,(1F 2U OA37)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-23 COMPONENT LIST OF CRT DRIVER (Z13)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Elect,(CE04W1V220)	22μF,±20%,35V		
C 2	Elect,(CE04W1V220)	22μF,±20%,35V		
C 3	Elect,(CE04W1V220)	22μF,±20%,35V		
C 4	Not assigned			
C 5	Not assigned			
C 6	Not assigned			
C 7	Not assigned			
C 8	Elect,(CE04W1E101)	100μF,±20%,25V		
C 9	Elect,(CE04W1E101)	100μF,±20%,25V		
C 10	Not assigned			
C 11	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 12	Plast,(ECQ-M1H 222KZ)	2200pF,±10%,50V		
C 13	Elect,(KX100VB-3.3)	3.3μF,±20%,100V		
C 14	Elect,(KX100VB-3.3)	3.3μF,±20%,100V		
C 15	Elect,(KX100VB-3.3)	3.3μF,±20%,100V		
C 16	Elect,(KX100VB-3.3)	3.3μF,±20%,100V		
C 17	Plast,(ECQ-M1H 104KZ)	0.1μF,±10%,50V		
C 18	Plast,(ECQ-M1H 103KZ)	0.01μF,±10%,50V		
C 19	Not assigned			
C 20	Cer,(DE1710R472K1kV)	4700pF,±10%,1kV		
C 21	Cer,(DE1710R472K1kV)	4700pF,±10%,1kV		
C 22	Cer,(DE1710R472K1kV)	4700pF,±10%,1kV		
C 23	Cer,(DE1710R222K1kV)	2200pF,±10%,1kV		
C 24	Cer,(DE1710R222K1kV)	2200pF,±10%,1kV		
C 25	Cer,(DE1710R222K1kV)	2200pF,±10%,1kV		
C 26	Cer,(CC924CH1H101J)	100pF,±5%,50V		
J 1	Connector,(U-PB1521)	15 pins		
J 2	Connector,(PI011-03M)			
J 3	Connector,(PI011-02M)			
J 4	Connector,(PI011-07M)			
J 5	Connector,(PI011-07M)			
L 1	Coil,(LH1-471K)	470μH		
L 2	Coil,(LH1-471K)	470μH		

( ): Manufacturer's part number
* : Selected at factory

Table 6-23 COMPONENT LIST OF CRT DRIVER (Z13)

CKT REF	DESCRIPTION	RATING		NOTE
Q 1	IC,(μPC258C)			
Q 2	IC,(TC4053BP)			
Q 3	Tr,Si,PNP,(2SA883)			
Q 4	Tr,Si,NPN,(2SC1833)			
Q 5	Tr,Si,NPN,(2SC1833)			
Q 6	Tr,Si,NPN,(2SC1833)			
Q 7	Tr,Si,NPN,(2SC1833)			
Q 8	Tr,Si,NPN,(2SC1279)			
Q 9	Tr,Si,NPN,(2SC1279)			
Q 10	Tr,Si,NPN,(2SC1279)			
Q 11	Tr,Si,NPN,(2SC1279)			
Q 12	Not assigned			
Q 13	Tr,Si,NPN,(2SC1833)			
Q 14	Tr,Si,NPN,(2SC1833)			
Q 15	Tr,Si,NPN,(2SC1279)			
Q 16	Tr,Si,NPN,(2SC1279)			
Q 17	Tr,Si,NPN,(2SC1279)			
Q 18	Tr,Si,NPN,(2SC1279)			
Q 19	Not assigned			
Q 20	Not assigned			
Q 21	Di,Si,(1S953)			
Q 22	Tr,Si,NPN,(2SC1833)			
Q 23	Tr,Si,NPN,(2SC1833)			
Q 24	Tr,Si,PNP,(2SA833)			
Q 25	Photocoupler,(PS2006B)			
Q 26	Di,Si,(1S953)			
Q 27	Di,Si,(1S953)			
Q 28	Tr,Si,NPN,(2SD297)			
Q 29	Tr,Si,NPN,(2SD297)			
Q 30	Not assigned			
Q 31	Di,Si,(1S1834)			
Q 32	Di,Si,(1S1834)			
Q 33	Di,Si,(1S1834)			
Q 34	Di,Si,(1S1834)			
Q 35	Tr,Si,PNP,(2SA845A Ⓗ)			
Q 36	Tr,Si,PNP,(2SA845A Ⓗ)			
Q 37	Tr,Si,PNP,(2SA845A Ⓗ)			
Q 38	Tr,Si,PNP,(2SA845A Ⓗ)			
Q 39	Tr,Si,PNP,(2SA845A Ⓗ)			
Q 40	Tr,Si,PNP,(2SA845A Ⓗ)			
Q 41	Not assigned			
Q 42	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 43	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 44	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 45	Tr,Si,NPN,(2SC1279)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-23 COMPONENT LIST OF CRT DRIVER (Z13)

CKT REF	DESCRIPTION	RATING		NOTE
Q 46	Di,Si,(SF-1)			
Q 47	Di,Si,(SF-1)			
Q 48	Di,Si,(SF-1)			
Q 49	Di,breakdown,(RD5.1E (3))	4.8 to 5.7V,400mW		
Q 50	Di,breakdown,(RD5.1E (3))	4.8 to 5.7V,400mW		
Q 51	Di,breakdown,(RD5.1EB)	4.8 to 5.4V,400mW		
Q 52	Di,breakdown,(RD9.1EB)	8.5 to 9.6V,400mW		
R 1	Var,MF,(RG161P20SB 10kΩM)	10kΩ,1/2W		
R 2	Not assigned			
R 3	Var,MF,(RG161P20SB 20kΩM)	20kΩ,1/2W		
R 4	Var,MF,(RG161P20SB 1kΩM)	1kΩ,1/2W		
R 5	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		
R 6	CF,(ARD25T392J)	3.9kΩ,±5%,1/4W		
R 7	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 8	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 9	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 10	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 11	Not assigned			
R 12	Var,MF,(RJ-6P 500Ω)	500Ω,1/2W		
R 13	Var,MF,(RJ-6P 100Ω)	100Ω,1/2W		
R 14	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 15	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 16	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 17	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 18	CF,(ARD25T272J)	2.7kΩ,±5%,1/4W		
R 19	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R 20	Not assigned			
R 21	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 22	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 23	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R 24	CF,(ARD25T182J)	1.8kΩ,±5%,1/4W		
R 25	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 26	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 27	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 28	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 29	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 30	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 31	Not assigned			
R 32	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 33	CF,(ARD25T104J)	100kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-23 COMPONENT LIST OF CRT DRIVER (Z13)

CKT REF	DESCRIPTION	RATING		NOTE
R 34	CF,(ARD25T563J)	56kΩ,±5%,1/4W		
R 35	CF,(ARD25T563J)	56kΩ,±5%,1/4W		
R 36	Not assigned			
R 37	Not assigned			
R 38	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 39	Var,MF,(RJ-6P 5kΩ)	5kΩ,1/2W		
R 40	Not assigned			
R 41	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 42	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 43	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 44	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 45	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 46	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 47	CF,(ARD25T821J)	820Ω,±5%,1/4W		
R 48	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 49	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 50	Not assigned			
R 51	CF,(ARD25T154J)	150kΩ,±5%,1/4W		
R 52	CF,(ARD25T154J)	150kΩ,±5%,1/4W		
R 53	CF,(ARD25T823J)	82kΩ,±5%,1/4W		
R 54	CF,(ARD25T823J)	82kΩ,±5%,1/4W		
R 55	Not assigned			
R 56	Not assigned			
R 57	CF,(ARD25T123J)	12kΩ,±5%,1/4W		
R 58	CF,(ARD25T183J)	18kΩ,±5%,1/4W		
R 59	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 60	Not assigned			
R 61	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 62	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 63	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R 64	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 65	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 66	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 67	CF,(ARD25T473J)	47kΩ,±5%,1/4W		
R 68	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 69	Not assigned			
R 70	Not assigned			
R 71	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 72	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 73	Not assigned			
R 74	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 75	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 76	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 77	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R 78	CF,(ARD25T124J)	120kΩ,±5%,1/4W		
R 79	CF,(ARD25T183J)	18kΩ,±5%,1/4W		
R 80	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

Table 6-23 COMPONENT LIST OF CRT DRIVER (Z13)

CKT REF	DESCRIPTION	RATING		NOTE
R 81	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 82	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 83	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		
R 84	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 85	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 86	CF,(ARD25T471J)	470Ω,±5%,1/4W		
R 87	CF,(ARD25T224J)	220kΩ,±5%,1/4W		
R 88	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 89	MF,(RH1HVS 1.2MΩJ)	1.2MΩ,±5%,1W		
R 90	MF,(RH1HVS 3MΩJ)	3MΩ,±5%,2W		
R 91	Var,MF,(RG161N15SB 500kΩM)	500kΩ,1/2W		
R 92	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 93	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 94	CF,(ARD25T151J)	150Ω,±5%,1/4W		
R 95	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R 96	Not assigned			
R 97	Not assigned			
R 98	Not assigned			
R 99	Var,MF,(RJ-6P 100kΩ)	100kΩ,1/2W		
R 100	Not assigned			
R 101	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 102	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 103	Var,MF,(RJ-6P 10kΩ)	10kΩ,1/2W		
R 104	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 105	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 106	Not assigned			
R 107	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 108	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
S 1	Pushbutton,(1F2UEE)			
S 2	Pushbutton,(1F2UEE)			
T 1	Trans,(439T23524)			
Z 1	Rectifier block,HV (MSL4532)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-24 COMPONENT LIST OF POWER SUPPLY (Z14)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Elect,(CE04W1V471)	470μF,±20%,35V		
C 2	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 3	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 4	Elect,(CE04W1E470)	47μF,±20%,25V		
C 5	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 6	Elect,(CE04W1A470)	47μF,±20%,10V		
C 7	Elect,(CE04W1A470)	47μF,±20%,10V		
C 8	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 9	Elect,(CE04W1A470)	47μF,±20%,10V		
C 10	Elect,(CE04W1A470)	47μF,±20%,10V		
C 11	Not assigned			
C 12	Plast,(ECQ-M1H 102KZ)	1000pF,±10%,50V		
C 13	Plast,(ECQ-M1H 473KZ)	0.047μF,±10%,50V		
C 14	Elect,(CE04W1E470)	47μF,±20%,25V		
C 15	Elect,(CE04W1A470)	47μF,±20%,10V		
C 16	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 17	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 18	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 19	Elect,(CE04W1A470)	47μF,±20%,10V		
C 20	Elect,(CE04W1A470)	47μF,±20%,10V		
C 21	Elect,(CE04W1A101)	100μF,±20%,10V		
F 1	Fuse,(MF51NN250V 2A DC01)	2A,250V		
F 2	Fuse,(MF51NN250V 2A DC01)	2A,250V		
F 3	Fuse,(MF51NN250V 2A DC01)	2A,250V		
F 4	Fuse,(MF51NN250V 2A DC01)	2A,250V		
J 1	Connector,(U-PB1519)	15 pins		
J 2	Connector,(U-PB1521)	15 pins		
J 3	Connector,(U-PB1519)	15 pins		
J 4	Connector,(U-PB1019)	10 pins		
M 1	Timer,(TM-O)			

( ): Manufacturer's part number
* : Selected at factory

44W73726 | 1/3

Table 6-24 COMPONENT LIST OF POWER SUPPLY (Z14)

CKT REF	DESCRIPTION	RATING		NOTE
Q 1	IC,(μPC151C)			
Q 2	Tr,Si,NPN,(2SC1833)			
Q 3	Di,Si,(V03G)			
Q 4	Di,breakdown,(RD5.1E (3))	4.8 to 5.7V,400mW		
Q 5	IC,(μPC251C)			
Q 6	IC,(μPC251C)			
Q 7	Di,breakdown,(RD5.1E (3))	4.8 to 5.7V,400mW		
Q 8	IC,(μPC16305H)			
Q 9	Tr,Si,NPN,(2SC2199)			
Q 10	Di,breakdown,(RD6.2EB)	5.8 to 6.6V,400mW		
Q 11	Di,Si,(1S953)			
Q 12	Rectifier,(M4C-31-12)			
Q 13	Di,breakdown,(RD7.5EB)	7.0 to 7.9V,400mW		
R 1	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R 2	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R 3	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 4	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 5	CF,(ARD25T222J)	2.2kΩ,±5%,1/4W		
R 6	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 7	MF,(RN14K2E1402D)	14kΩ,±0.5%,1/4W		
R 8	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 9	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 10	Not assigned			
R 11	MF,(RN14K2E1402D)	14kΩ,±0.5%,1/4W		
R 12	MF,(RN14K2E1002D)	10kΩ,±0.5%,1/4W		
R 13	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 14	Var,MF,(RJ-6P 1kΩ)	1kΩ,1/2W		
R 15	CF,(ARD25T153J)	15kΩ,±5%,1/4W		
R 16	CF,(ARD25T152J)	1.5kΩ,±5%,1/4W		
R 17	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 18	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 19	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 20	Not assigned			
R 21	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 22	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 23	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 24	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 25	CF,(ARD25T103J)	10kΩ,±5%,1/4W		
R 26	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 27	CF,(ARD25T472J)	4.7kΩ,±5%,1/4W		
R 28	CF,(ARD25T471J)	470Ω,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

44W73726 | 2/3

Table 6-24 COMPONENT LIST OF POWER SUPPLY (Z14)

CKT REF	DESCRIPTION	RATING		NOTE
R 29	CF,(ARD25T102J)	1kΩ,±5%,1/4W		
R 30	CF,(ARD25T105J)	1MΩ,±5%,1/4W		
R 31	CF,(ARD25T332J)	3.3kΩ,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

44W73726 | 3/3

Table 6-25 COMPONENT LIST OF AVG (Z15)

CKT REF	DESCRIPTION	RATING		NOTE
C 1	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 2	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 3	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 4	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 5	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 6	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 7	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 8	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 9	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 10	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 11	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 12	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 13	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 14	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 15	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 16	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 17	Cer,(CK924C1H472M)	4700pF,±20%,50V		
C 18	Cer,(CC924CH1H101J)	100pF,±5%,50V		
C 19	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 20	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 21	Cer,(CC924CH1H221J)	220pF,±5%,50V		
C 22	Elect,(CE04W1V220)	22μF,±20%,35V		
C 23	Not assigned			
C 24	Not assigned			
C 25	Not assigned			
C 26	Not assigned			
C 27	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 28	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 29	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 30	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 31	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 32	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 33	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 34	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 35	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 36	Elect,(CE04W1A470)	47μF,±20%,10V		
C 37	Elect,(CE04W1A470)	47μF,±20%,10V		
C 38	Elect,(CE04W1A470)	47μF,±20%,10V		
C 39	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 40	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 41	Cer,(CC924CH1H471J)	470pF,±5%,50V		
C 42	Cer,(CC924CH1H471J)	470pF,±5%,50V		
J 1	Connector,(U-SA1501)	15 pins		
J 2	Connector,(U-SA2201)	22 pins		

( ): Manufacturer's part number
* : Selected at factory

44W73727 | 1/3

Table 6-25 COMPONENT LIST OF AVG (Z15)

CKT REF	DESCRIPTION	RATING		NOTE
Q 1	IC,(74LS283)			
Q 2	IC,(74LS283)			
Q 3	IC,(74LS283)			
Q 4	IC,(74LS367A)			
Q 5	IC,(74LS367A)			
Q 6	IC,(HM6116P-2)			
Q 7	IC,(HM6116P-2)			
Q 8	IC,(74LS174)			
Q 9	IC,(74LS174)			
Q 10	IC,(74LS174)			
Q 11	IC,(74LS174)			
Q 12	IC,(74LS174)			
Q 13	IC,(74LS174)			
Q 14	IC,(μPC624D)			
Q 15	IC,(μPC624D)			
Q 16	IC,(μPC624D)			
Q 17	IC,(μPC624D)			
Q 18	IC,(μPC258C)			
Q 19	IC,(74LS174)			
Q 20	IC,(74LS174)			
Q 21	IC,(74LS174)			
Q 22	IC,(74LS174)			
Q 23	IC,(μPC624D)			
Q 24	IC,(μPC624D)			
Q 25	IC,(μPC624D)			
Q 26	IC,(μPC624D)			
Q 27	IC,(μPC258C)			
Q 28	IC,(74LS293)			
Q 29	IC,(TC4040BP)			
Q 30	IC,(74154)			
Q 31	IC,(74LS00)			
Q 32	IC,(TC40H000P)			
Q 33	Di,Si,(1S953)			
Q 34	IC,(74LS21)			
Q 35	IC,(74LS21)			
Q 36	Di,breakdown,(RD5.1E3)	4.8 to 5.4V,400mW		
R 1	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 2	MF,(RN14K2E1302D)	13kΩ,±0.5%,1/4W		
R 3	MF,(RN14K2E2741D)	2.74kΩ,±0.5%,1/4W		
R 4	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 5	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-25 COMPONENT LIST OF AVG (Z15)

CKT REF	DESCRIPTION	RATING		NOTE
R 6	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 7	MF,(RN14K2E25R5D)	25.5Ω,±0.5%,1/4W		
R 8	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 9	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 10	MF,(RN14K2E1302D)	13kΩ,±0.5%,1/4W		
R 11	MF,(RN14K2E2741D)	2.74kΩ,±0.5%,1/4W		
R 12	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 13	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 14	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 15	MF,(RN14K2E25R5D)	25.5Ω,±0.5%,1/4W		
R 16	MF,(RN14K6491D)	6.49kΩ,±0.5%,1/4W		
R 17	Not assigned			
R 18	Not assigned			
R 19	Not assigned			
R 20	Not assigned			
R 21	Not assigned			
R 22	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 23	MF,(RN14K2E1302D)	13kΩ,±0.5%,1/4W		
R 24	MF,(RN14K2E2741D)	2.74kΩ,±0.5%,1/4W		
R 25	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 26	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 27	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 28	MF,(RN14K2E25R5D)	25.5Ω,±0.5%,1/4W		
R 29	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 30	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 31	MF,(RN14K2E1302D)	13kΩ,±0.5%,1/4W		
R 32	MF,(RN14K2E2741D)	2.74kΩ,±0.5%,1/4W		
R 33	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 34	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 35	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 36	MF,(RN14K2E25R5D)	25.5Ω,±0.5%,1/4W		
R 37	MF,(RN14K2E6491D)	6.49kΩ,±0.5%,1/4W		
R 38	CF,(ARD25T101J)	100Ω,±5%,1/4W		
R 39	CF,(ARD25T104J)	100kΩ,±5%,1/4W		
R 40	CF,(ARD25T681J)	680Ω,±5%,1/4W		
R 41	CF,(ARD25T331J)	330Ω,±5%,1/4W		
R 42	CF,(ARD25T331J)	330Ω,±5%,1/4W		

( ): Manufacturer's part number
* : Selected at factory

Table 6-26 COMPONENT LIST OF GP-IB BOARD Z8

CKT REF	DESCRIPTION	RATING		NOTE
C 1 to C 18	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
C 19	Elect,(CE04W1A470)	47μF,±20%,10V		
C 20 to C 54	Not assigned			
C 55	Cer,(CK924C1H104M)	0.1μF,±20%,50V		
J 1	Produced by pattern			
J 2	Connector, (HIF23A-34D-AA20S)			
J 3	Connector, (HIF23A-30D-AA30S)			
J 4	Connector, (HIF23A-16D-AA40S)			
L 1	Not assigned			
L 2	Not assigned			
L 3	Not assigned			
Q 1	IC,(74LS244)			
Q 2	IC,(74LS244)			
Q 3	IC,(74LS373)			
Q 4	IC,(74LS244)			
Q 5	IC,(74LS367)			
Q 6	IC,(HM6116P-2)			
Q 7	IC,(HM6116P-2)			
Q 8	IC,(74LS138)			
Q 9	IC,(74LS138)			
Q 10	IC,(74LS32)			
Q 11	IC,(74LS32)			
Q 12	IC,(74LS174)			
Q 13	IC,(8291A)			
Q 14	IC,(SN75160)			
Q 15	IC,(SN75161)			
Q 16	IC,(74LS244)			
Q 17	IC,(74LS125)			
Q 18	IC,(74LS244)			

( ): Manufacturer's part number
* : Selected at factory

Table 6-26 COMPONENT LIST OF GP-IB BOARD Z8

CKT REF	DESCRIPTION	RATING		NOTE
Q 19 to Q 49	Not assigned			
Q 50	IC,(74LS00)			
Q 51	IC,(HM6116P-2)			
R 1	Single in-line array, (IHR-6-472JA)	4.7kΩ×6		
R 2 to R 26	Not assigned			

( ): Manufacturer's part number
* : Selected at factory

Table 6-27 COMPONENT LIST OF CONNECTOR BOARD Z18

CKT REF	DESCRIPTION	RATING		NOTE
J 1	Connector, (HIF3-30P-2.54DS)			
J 2	Connector, (57-20240-8D35)			
S 1	Switch, (B-6A)			

( ): Manufacturer's part number

• : Selected at factory

44W74836 1/1

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